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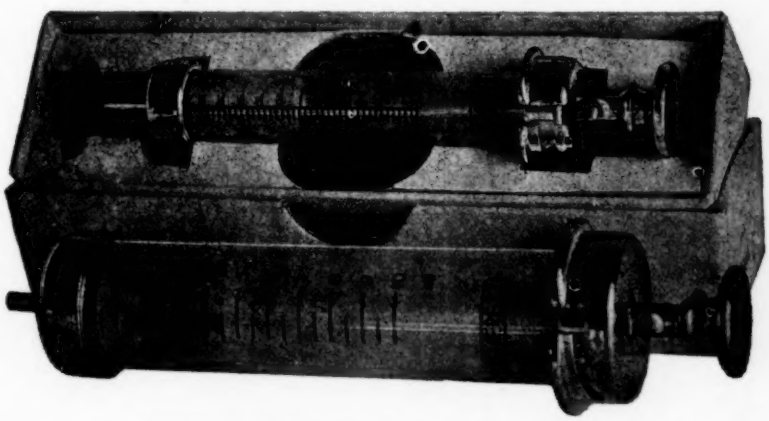

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AN UNUSUAL BULLOUS ERUPTION

R. LANG, B.A., M.B., CH.B. (DUBL.)
and
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An African male, 28 years of age, was admitted to the dermatological wards of the Groote Schuur Hospital on 20 March 1954 suffering from an extensive bullous eruption involving the arms and legs and associated with a temperature of 106°F.

Apparently he had consulted his practitioner previously, on 13 March, for low lumbar backache and infestation by roundworms. Treatment was given, consisting of methyl salicylate ointment and oil of chenopodium. A week later, bullae began to appear on the arms and legs and he was then admitted to hospital. At no time was a history obtained of any other medication nor had the patient ever had any previous illnesses, apart from variola in childhood. He had not been vaccinated and there was no recent injury, nor had he been handling meat. His diet had been satisfactory.

On Examination

At 5 p.m. on Saturday, 20 March, in spite of the hyperpyrexia, the patient was able to sit up in bed and give a comparatively coherent history without appearing to be in any great discomfort. Apart from his arms and legs, which were covered with large, flaccid, unruptured bullae containing clear fluid, the skin surface was intact. The face and trunk showed patches of darkly pigmented macules but no bullae. There was nothing abnormal in the appearance of the scalp and body hair. There was a mild purulent conjunctivitis and the buccal mucosa was partly denuded. There was no urethritis or dysuria.

The blood pressure was 135/50 mm. Hg. There was a generalized lymphadenopathy though no hepato-splenomegaly. Further clinical examination revealed nothing abnormal in the other systems; *nil* found on X-ray of chest.

Malignant pemphigus having been excluded on the history and clinical appearance, a tentative diagnosis was made of severe bullous erythema multiforme, possibly of the Stevens-Johnson type, and with this in view he was given 'broad spectrum' antibiotics.

Although the patient was fairly comfortable that night and the next day, a dramatic change took place the following evening, when the skin began to shed in great sheets, leaving raw, denuded surfaces resembling severe burns (see Fig. 1), with the hairs, however, remaining firm and intact in their follicles. The skin on the palms and soles became loose and was attached only here and there. From then on the patient's condition deteriorated with great rapidity; he became maniacal with the severe pain and had to be heavily sedated. He was by now profoundly shocked though still conscious.

Fig. 1. Photograph taken on the morning of 22 March, showing the immense denuded areas with a few loosely attached shreds of normal black epidermis.

Nikolsky's sign was positive.

Special Investigations

Blood: Haemoglobin 15 g.%. Leucocytes 7,800 per c.mm. Wassermann negative. Albumin 3·7 g.%, globulin 2·5 g.%. Thymol turbidity 1, thymol flocculation 0.

Urine: No abnormal constituents. No porphyrins.

Culture of bullous fluid: No fungi. Heavy mixed growth of coagulase-positive *Micrococcus pyogenes aureus* and *B. subtilis*.

Culture from mouth: No pathogens isolated.

Biopsies

Skin from palm of hand. The specimen appeared to consist chiefly of superficial layers of epidermis, showing a very thick layer of keratin and a zone of parakeratosis. Beneath this was degenerate tissue probably representing the deeper layers of the epidermis. Dermis was not present.

Strip of skin denuded from trunk. This tissue was very degenerate but, judging from the amount of pigment present, probably included the basal layer of the epidermis. A few polymorphs were present in the tissues.

Snip from denuded area on the trunk. Histologically this consisted of collagenous tissue, apparently dermal in origin, showing no vascular or inflammatory lesions.

Progress and Treatment

On admission the patient was given Aureomycin, 500 mg. 6-hourly, on the assumption that this was a Stevens-Johnson syndrome. He remained comfortable until the next night, when he began to shed his skin. Intravenous therapy consisting of hydrocortone, potassium chloride, protein hydrolysates and vitamins in plasma was instituted forthwith. On the night of 22 March he lost consciousness, which he never regained. He died at 11 p.m. on 23 March.

Autopsy

The body was that of a Bantu male aged about 28 years, 5 feet 7 inches in height and weighing 140 lb.

The skin of the scalp was normal and the hair showed no abnormalities.

On the central part of the face there were prominent follicles with plugging of the pilo-sebaceous orifices. The lips were denuded of their mucous membrane.

The skin of the palms of the hands was normal but that over the soles of the feet showed a rather mottled, slate-grey pigmentation. The nails of the fingers and toes were normal.

The striking feature of the autopsy was the loss of large sheets of skin from the whole body, with no localized bulla or vesicle formation. The dermis was smooth and there was a general hyperaemia. The hair of the trunk was not altered in any way.

The tongue presented a smooth, pale surface due to a loss of superficial epithelium. No other abnormalities of the mouth, oropharynx or larynx were noted. The oesophagus was normal throughout its whole length.

The mucosal surfaces of the bronchi were smooth and glistening. The lungs showed a bilateral early basal suppurative bronchopneumonia.

The visceral and parietal pericardial surfaces were normal. The heart appeared normal in every respect.

The peritoneum had a normal glistening appearance and there was no free fluid. The stomach was moderately dilated and contained a little mucus; its mucosa showed post-mortem digestion but no areas of ulceration. There was no deviation from the normal in the rest of the intestine.

The liver, spleen, pancreas, gall-bladder, adrenals, kidneys, urinary bladder, rectum and genitalia were all normal.

Post-mortem Histopathology

Abdominal Skin: There was complete detachment of the epidermis from the dermis at the dermo-epidermal junction. The stratum corneum showed diffuse separation of the cornified cells along the planes of cleavage. This separation followed the pluggings of the pilo-sebaceous follicles and was not characterized by any interstitial material. The stratum granulosum was poorly visible but appeared to be intact. The stratum malpighii was characterized by an extensive and uniformly diffuse disruption, which consisted of all grades of cyst formation, from a single large vacuole of prickle-cell cytoplasm to actual formation of vesicles and bullae, many of the latter having become confluent. The intercellular bridges were not apparent in the disrupted areas. Many cells of the malpighian layer showed a progressive loss of eosinophilic staining of the cytoplasm, associated with eccentrically positioned nuclei which, however, retained their normal staining characteristics even when marked vacuolation of the cell had occurred. The bullae appeared generally to have erupted downwards and were not packed by any material, although the majority contained free red blood-corpuscles and free and intrahistiocytic melanin. Fibrin and polymorphonuclear leucocytes were not present, as a rule. There were normal numbers of pigmented basal cells in the basal layer but the malpighian layer showed a well-marked increase of melanin-carrying cells. No part of the epidermis was normal in its full thickness. The papillary layer of the dermis was quite intact. The dermo-epidermal cleavage extended downwards along the necks of the pilo-sebaceous glands and, in some instances, had separated the sebaceous glands from the adjacent dermis. The arterioles of the dermis were moderately dilated and some contained fibrin thrombi. The dermal lymphatics were dilated and contained moderate numbers of red blood-corpuscles. The hair follicles and sebaceous glands were normal in appearance.

The Scalp showed similar dermo-epidermal cleavage. There was a well-marked perivascular round-cell infiltration in the superficial and mid-dermis. The dermal vessels had both round-cell and granular-cell exudations.

The Skin from the Inner Thigh, Chest and Nose showed changes similar to those described in the abdominal skin. In the subpapillary layer of the dermis from the chest there was uniform perivascular and perilymphatic round-cell infiltration.

Liver. There was no disturbance of the architecture of the liver cell columns. While some red cells were seen in the sinusoids, there was no congestion. Some of the liver cells contained glycogen-filled nuclei and there was a deposition, in some areas, of a fine, granular, yellowish-brown pigment probably due to 'wear and tear'. The portal tracts were normal.

Pituitary. Histological examination revealed nothing abnormal.

Lung. A moderate degree of patchy oedema, some anthracosis and, in areas, a trifling peri-bronchiolar inflammatory cell response were seen.

Suprarenal Glands. There appeared to have been a fair amount of post-mortem autolysis. Even so, the zona fasciculata contained very little lipoid and this finding could perhaps have been regarded as representing a rather 'exhausted' adrenal.

The Small Intestine was passed as normal.

CONCLUSION

The authors were unable, after exploring all avenues for causative factors, to account for the unusual features presented in this case. The general practitioner first consulted by the patient had given him oil of chenopodium, which is known to be toxic to the liver and central nervous system but not to the skin. There was no evidence of erythema or vesiculation on the lumbar area, where the small amount of counter-irritant ointment containing methyl salicylate and capsicum had been applied.

There had been no occupational hazards in the nature of contact with caustics, quicklime or other strong chemicals at the cement factory where he was employed.

Tribal and urbanized Africans are still in the habit of consulting witch-doctors, who frequently use cantharides which, when given by mouth in large doses, causes violent gastro-enteritis and, when applied locally, may produce extensive erythema and vesiculation. At no time did the patient suffer diarrhoea or show any signs of local erythema. He and his relatives denied that he had obtained advice from anybody but his medical practitioner. These facts were later confirmed during police investigations.

We express our thanks to Dr. R. Schapera, Assistant Government Pathologist, for his detailed post-mortem reports and unfailing cooperation in our attempts to elicit the cause of death in this strange case.

UNION DEPARTMENT OF HEALTH BULLETIN

Union Department of Health Bulletin. Report for the 7 days ended 19 January 1956.

Plague, Smallpox, Typhus Fever: Nil.

Epidemic Diseases in Other Countries.

Plague: Nil.

Cholera in Dacca (Pakistan).

Smallpox in Kandahar (Afghanistan); Rangoon, Tavoy (Burma); Bombay, Delhi, Kanpur, Madras (India); Dacca (Pakistan); Hué, Tourane (Danang) (Viêt-Nam).

Typhus Fever in Baghdad (Iraq); Alexandria (Egypt).

South African Medical Journal

Suid-Afrikaanse Tydskrif vir Geneeskunde

VAN DIE REDAKSIE

DIE MEGANIEK VAN INSULIEN

Daar is ontsaglik baie oor insulien geskrywe maar ten spyte van alles wat al gedoen is, bly die meganisme, wat hierdie hormoon se werking bepaal, nog 'n raaisel. In onlangse publikasies het Stadie[1, 2] die belangrikheid van verskeie opvattings en hul verwantskap tot mekaar bespreek. Stadie se eie bydrae op hierdie gebied is groot.

Jare gelede al het Minkowski en von Mehring getoon dat 'n toestand wat op suikersiekte gelyk in honde bewerkstellig kan word deur verwydering van die alvleesklier: 'n aanduiding dat die ondoeltreffende metabolisme in suikersiekte te wyte is aan die afwesigheid van een of ander bestanddeel wat deur die pankreas vervaardig word. Later was ontdek dat as die voorste harsingslymklier of die bynier terselfdertyd verwyder word, dit verligting in die toestand bring; daar bestaan dus 'n ingewikkelde tussenspel van die hormone en as die balans versteur word kan dit tot ernstige indien nie noodlottige metabolisme-afwykings lei.

Vir baie jare is die biochemiese beeld van suikersiekte te eenvoudig geteken: 'n ophoping van glukose veroorsaak hiperglisemie en glikosurie, die hoeveelheid glikogeen in spier en lewer neem af, die asemhalingsyfer is laag—te wyte aan verminderde oksidering van glukose—die liggaam verloor vet en weefsel, ketose en verhoogde uitskeiding van stikstof vind plaas. Die gebruik van ligspore in metabolisme-navorsing, die vooruitgang op die gebied van ensiemchemie en die eksperimentele gebruik van oorlewende weefsels help om die insulienmeganiek in intermediêre metabolisme beter te begryp.

Die moontlike biochemiese gebreke, wat deur 'n tekort aan insulien of 'n oormaat van die teengestelde vloeistoffaktore veroorsaak word, kan nou met meer helderheid beskou word. Stadie[1] bespreek die bevindings i.v.m. moontlike insulienmeganiek:

1. Verhoogde deurdringbaarheid van die sel of van die oordrag van glukose in die sel na die plek waar ensiem-aktiwiteit plaasvind.
2. Versnelling van die heksokinase-reaksie.
3. Verhoogde produksie van hoë energie fosfaat en
4. 'n Uitwerking op oksideringsreaksies veral van die Krebs-kringloop.

Die eerste hipotese veronderstel 'n biochemiese gebrek wat 'n ontwrigting veroorsaak in die deurdringing van glukose deur selversperrings tot by die plekke waar ensiem-aktiwiteit plaasvind. By sel-oppervlaktes, of miskien by *cell-particulate interfaces*, wat ensiemstelsels van mekaar skei, bestaan daar versperrings wat

EDITORIAL

THE ACTION OF INSULIN

The literature dealing with insulin is vast; yet in spite of all that has been done the mechanism of action of this hormone remains an unsolved problem. Various concepts have been put forward. The importance of each of these and their relation to one another have been considered in recent publications by Stadie,[1,2] who has himself contributed much in this field.

It is now many years since it was shown by Minkowski and von Mehring that a condition resembling diabetes mellitus can be produced in dogs by removal of the pancreas, indicating that the defective metabolism in diabetes mellitus is due to the absence of some principle produced by the pancreas. It was later found that simultaneous removal of the anterior pituitary or of the adrenal glands ameliorates the condition, showing that there is a complex interplay of hormones whose imbalance may produce serious if not fatal metabolic aberrations.

The biochemical picture in diabetes was for many years greatly over-simplified: accumulation of glucose causes hyperglycaemia and glycosuria, the glycogen in muscle and liver is reduced in quantity, the respiratory quotient is low, owing to diminished oxidation of glucose, and a loss of body fat and body tissue occurs, with ketosis and increased excretion of nitrogen. A better understanding of the action of insulin in intermediary metabolism has been helped by the introduction of tracers into metabolic studies, the development of enzyme chemistry, and the experimental use of surviving tissues.

The possible biochemical defects caused by deficiency of insulin or excess of the opposing humoral factors can now be considered more intelligibly. Stadie[1] has evaluated the evidence for the possible modes and sites of action of insulin. These are (1) an increase of cell permeability or transfer of glucose across the cell to sites of enzyme activity, (2) acceleration of the hexokinase reaction, (3) increase of high-energy phosphate formation, and (4) an effect on oxidative reactions, particularly of the Krebs cycle.

In the first hypothesis there is believed to be a biochemical lesion which disturbs the permeation of glucose across cell barriers to sites of enzyme action. At cell surfaces, or perhaps at cell-particulate interfaces which separate enzyme systems from one another, there

miskien verstoor word wanneer die balans van hormone soos bv. insulien omver gegooi word. Daar is rede om te glo dat hormone invloed uitoefen op die oordrag van glukose en anders suikers na die ensiemvestings. Die versperring wat glukose agter selgrense hou word deur die werking van insulien gelig, maar hoe hierdie meganisme werk is nog onbekend.

Die tweede biochemiese gebrek, wat moontlik op 'n tekort aan insulien volg, staan in verband met glukose-aktivering. Normaal word glukose vir verdere stofverwisseling voorberei deur die vorming van glukose-6-fosfaat gekataliseer deur gluko-heksokinase wat in feitlik alle selle gevind word. As die werking van hierdie ensiem gesteur word, word minder glukose-6-fosfaat saamgestel. Hierdie belemmering in die heksokinase-reaksie kan miskien al die metaboliese steurings verklaar wat by suikersiekte bespeur word. Dit kom egte voor of die bewyse i.v.m. met eersgenoemde hipotese—waarby 'n oordra-meganisme betrokke is—meer oortuigend is as dié ten gunste van 'n reaksie op heksokinase of ander spesifieke ensieme.

Ten derde bestaan daar baie bewyse om die opvatting te staaf dat gebrekkige produksie van hoë energie fosfate in verband staan met suikersiekte of insulienmeganiek. Indirekte bewyse dui aan dat hoë energie fosfaat wel onder suikersiekte-toestande vervaardig word. Meer direkte bewyse is verkry met die studie van protoplasmadrade deur middel van die differensiële sentrifugering van lewerhomogenate. Sulke tegnieke bewys dat gebrekkige oksidatiewe fosforilering plaasvind in die lewer (protoplasmadraadbereidings) van katte wat se alvleesklier verwyder is. Die juiste betekenis van hierdie bevindings vereis verdere navorsing.

'n Vierde moontlike plek waar insulienwerking plaasvind, word in die literatuur bespreek. Dit staan in verband met oksideringsreaksies waarby die Krebs-kringloop betrokke is, maar omdat afwykende resultate met sekere eksperimente verkry is,[1] word die bestaan van hierdie suikersiektegebrek nie geheel en al aanvaar nie.

Op hierdie stadium kan geen grondige uitspraak oor die insulienmeganiek gegee word nie.

1. Stadie, W. C. (1955): Amer. J. Med., **19**, 257.
2. *Ibid.* (1954): Phys. Rev., **34**, 52.

are barriers that may be altered by imbalance of hormones such as insulin. There is evidence that the transfer of glucose and other sugars to enzyme sites is under hormonal control. The barrier which can prevent glucose from passing across cell boundaries is lifted by the action of insulin, but the mechanism of action remains unknown.

The second biochemical lesion which may possibly occur when there is lack of insulin is related to the activation of glucose. Glucose is normally prepared for further metabolism by the formation of glucose-6-phosphate catalyzed by glucohexokinase which is present in practically all cells. Interference with the action of this enzyme results in diminished formation of glucose-6-phosphate. This impairment of the hexokinase reaction might explain all the metabolic derangements observed in diabetes mellitus. However, the evidence for the first-mentioned hypothesis, involving a 'transfer mechanism' appears to be stronger than that in favour of an action on hexokinase or other specific enzymes.

Thirdly, there is much evidence to support the view that defective production of high-energy phosphates is associated with the diabetic state or the action of insulin. Evidence of indirect nature has indicated that high-energy phosphate formation does occur in the diabetic state. More direct evidence has been obtained from a study of mitochondria obtained by differential centrifugation of homogenates of liver. By such techniques oxidative phosphorylation was found to be deficient in the liver (mitochondrial preparations) of depancreatized cats. The full significance of these findings requires further study.

A fourth possible site of action of insulin considered in the literature is concerned with the oxidative reactions involving the Krebs cycle, but because of anomalous results obtained in certain experimental studies,[1] the existence of this type of diabetic defect has not been altogether convincing.

No decision can be made at this stage concerning the true mode of action of insulin.

1. Stadie, W. C. (1955): Amer. J. Med., **19**, 257.
2. *Ibid.* (1954): Phys. Rev., **34**, 52.

EXTRACORPOREAL HEMODIALYSIS*

MARIO BATTEZZATI, M.D. AND CARLO TADDEI, M.D.

Genoa, Italy

A. GENERAL

To understand the nature of extracorporeal dialysis, we believe that one should know the complex phenomena regulating the water exchange of a living being and the consequent electrolytic and protein equilibrium of the extracellular and intracellular liquids. The water of our body, representing 2/3rds of the body's weight, is the substance which transports the components of living matter and the substratum of every metabolic reaction. It is in continuous movement from one section of the organism to another, thus creating a perfect equilibrium of the so-called 'internal environment'.

We owe to Claude Bernard the conception of the 'internal environment'—with which the great physiologist succeeded in giving an exact biological definition of the essence of life in the living being. 'We must

* From the Clinica Chirurgica Generale Reparto di Chirurgia Sperimentale della Universita di Genova. A paper presented at the South African Medical Congress, Pretoria, October 1955.

distinguish', he said, 'between the cosmic or outer environment, which completely surrounds the individual and the organic or inner environment, which is in immediate contact with the anatomical elements of which the living being is composed; every vital mechanism whatsoever has but one purpose, to maintain the unity of the conditions of life of the inner environment; this internal environment is composed of circulating liquid that surrounds and irrigates all the anatomical elements of the tissues; that is to say, it is the liquid part of the blood, which penetrates into the tissues and constitutes the whole of the interstitial liquids'. Later, Cannon called this dynamic equilibrium of the internal environment 'homeostasis'.

In the lowest order of living beings there is a situation of direct dependance of the internal environment upon the external environment, so that every variation of the later provokes a proportional variation of the internal equilibrium. Under such conditions, the life of the living being in relation to the external environment is a great deal easier, being reduced to the expression of elementary hydrosaline exchanges, surpassing by such an affirmation the philosophical concept of vital energy contained and outlined in matter. This hydrosaline flux and reflux between the environment and the living being (the internal environment of which is thus a part of the same environment), tends to level itself, just as a liquid tends to acquire the same level in two connecting jars. On the contrary, in living beings of the higher orders, the internal environment is independent of the external environment. This independence and liberty is dearly bought and maintained at any price, on pain of loss of life itself. The living being is thus in a continual struggle against the external environment to maintain its own physical individuality invariably, being inclined to favour its own independence and liberty.

And, as in the life-relationship the voluntary nervous system is the means by which man defends himself as a whole against the external, disintegrating elements, so in the life of the tissues and organs, neurovegetative and hormone factors preside in the equilibrium of the internal environment. This equilibrium is closely tied up to the hydrosaline exchange, meaning the variations in the amount of water and of the elements contained in it, in regard to the determining factors of osmotic pressure and acid-base equilibrium. Our organism may be imagined as a great lake of salt water in which the cellular elements are immersed. Into it are continually poured the most varied substances, which the organism disintegrates and modifies in order to make use of them if they are necessary to life or to eliminate them if they are superfluous or damaging. There are, therefore, some organs which have the very delicate and difficult function of maintaining at any cost the substances of the inner environment, eliminating the metabolic substances which would be damaging. Among these organs the most important and delicate is certainly the kidney.

This great lake-source of life is divided into various sections in which, on one hand, first consideration is given to the intracellular liquids, as water in vital combination and extracellular liquids make up the blood and interstitial liquids. The extracellular liquids play an extremely important role of defence and of balance between the cells on one side and the function of the emunctories and the kidney in particular, on the other, acting as a buffer for the variations coming from the outside.

There is, therefore, at one end of the cycle, the cell with a limiting membrane that functions as a dialyzing membrane but also has a secreting and discriminating power on the substances it gives up or acquires. At the other end of the cycle are the emunctory organs, first amongst them the kidney, which maintains the balance of the internal environment. Between the two end-pilasters of the system, cell and kidney, there is the bulk of extracellular liquid that is in continuous hydrosaline equilibrium, in which the vascular walls have, among other functions, the typical one of the dialyzing membrane. Also a part of this system is the glomerular filtrate which, later, is regulated and discriminated by the secretive activity of the renal tubules that recovers most of it according to plasmatic needs.

Summing up: In physiological conditions there are two fixed points with immutable laws; the cell on one side and consequently the renal excretory and secretive function on the other. Between these two extremes there are various communicating sections divided by dialyzing membranes which maintain an internal environment sufficiently balanced and consonant with the vital needs of the cell.

It should here be noted parenthetically that the interstitial liquids are practically an ultrafiltrate of the plasma as is the glomerular or preurine filtrate.

Two fundamental factors dominate the regulation of such a system of internal equilibrium, viz. *osmotic pressure* and *acid-base equilibrium*. The first is sustained by all the particles of the substances dissolved in the water, and consequently the smaller the particles (molecules or ions) the more they are proportionate to high osmotic pressure; thus the salts dissolved are largely responsible for the values of this pressure. The acid-base equilibrium has as substratum the ions dissolved with their electric charge, which may be negative or positive. Such equilibrium is regulated by the tampon system established by the relation between carbonic acid (H_2CO_3) and carbonates ($BHCO_3$), a relation that must remain fixed in physiological conditions (1 : 20).

We should like at this point to make it clear what is meant by osmotic pressure. If an aqueous solution is put in contact with water through a membrane of vegetable or animal origin (dialyzing membrane), the solution tends to penetrate the water (exosmosis) in order to balance itself, while the water tends to pass into the solution (endosmosis). This phenomenon is the fundamental element of the hydrosaline balance of our inner environment, conditioned by and closely connected with, the acid-base equilibrium. But what seems to us to need clarification, and what is surely essential to a large comprehension of the complexity of the problem, is the fact that to obtain osmotic balance the water shifts rapidly from one section to another (endosmosis) while the salts move more slowly in the opposite direction (exosmosis), so that the balance is more quickly obtained with the less damaging and more

mobile element. And this, we repeat, seems to us a fundamental element in the mechanism of hydrosaline balance. It comes from the apparently paradoxical fact that the elements at highest osmotic pressure—for example chlorine and sodium in the extracellular liquids—penetrate more slowly into the cells while they draw water rapidly from them.

To the two factors in the play of the movements of water and salts thus expounded, must be added the *absorbent factor or oncotic pressure* exercised by the proteins on the water, through which this element becomes a part of the complex regulation of the going and coming of this same water. It might be said that the proteins exert on the water an action similar to inertia so as not to create excessive unbalance and displacements. They have, furthermore, great importance in recalling the water from the extracellular spaces in the venous capillary system where the hydrostatic pressure, which was high in the arterial region, has necessarily fallen.

Very briefly, and with only elementary and inadequate facts and imagery, we have tried to illustrate the complexity of the phenomena inherent in hydrosaline exchange and in the maintenance of homeostasis of the human organism. Impinging upon what we have said is a concept which is at the base of all these vital phenomena; that is, the *concept of dialysis*, which arises from a particular property already illustrated, of the vegetable and animal membranes. The concept of dialysis thus brings us back to this particular activity of the animal and vegetable membrane which governs in an elastic manner the equilibrium of the solutions placed in contact through it. In fact, with its special dialyzing properties, it performs the function of mixing up the two solutions, making them rapidly equal in the content of the particles of the solute. The rapid passage of the water from one section to the other through the membrane may remind us of the function of an agitator, which makes any solution whatsoever uniform.

Dialysis in the Kidney

Such a dialyzing property is also a fundamental one of the kidney which, in its glomerular function and in the first tract of the tubule, carries on the formation of an ultrafiltrate plasma entirely similar to that of the interstitial liquids. This filtration in the glomerule is essentially subject to the action of the hydrostatic pressure of the blood in the same manner that, in the capillaries, hydrostatic pressure is the fundamental factor in the escape of the liquids into the interstitial spaces. Therefore, immediately afterwards, in the first part of the tubules, there is a phenomenon of dialysis through the difference of osmotic pressure between plasma and content of the tubules, by which a great quantity of water and salts (85% in water) is reabsorbed. This phenomenon is called iso-osmotic reabsorption. Finally, in the terminal tract of the tubules occurs a selective and discriminative action of the tubular cells, whose biological activity leads to an active reabsorption of liquids and substances against the same force of osmosis. There is thus formed a hypertonic liquid by which occurs the so-called phenomenon of concentration of the urine. This activity is dependent upon the antidiuretic hormone of the posterior lobe of the hypophysis.

The renal function is, therefore, one of the fundamental elements in the regulation of the interior environment of our organism, for which reason MacCullum (rightly stating that the establishing of a closed aqueous system has been the greatest victory in the history of animal organism) defined the kidney as the evolutionary organ *par excellence*. But what we should like to bring out at this point is that in the kidney, in as far as we have described it above, there occur in a brief space the same phenomena, dominated by the same forces, that we find in the various sections that we have described of our organism. That is to say, the glomerular function creates an ultrafiltrate of plasma as does the arterial capillary, and this phenomenon is controlled in both by hydrostatic pressure. A large part of the ultrafiltrate in the initial tract of the tubule passes into the blood, as from the interstitial spaces liquid re-enters into the venous capillaries, by a phenomenon pure and simple of dialysis controlled by osmotic pressure and by oncotic pressure. Finally there occurs in the distal tubule a biological activity of selection and discrimination with a well-defined finality, just as in the cells opposite the interstitial liquids there is manifested that complex of biological phenomena that gives consistency and reality to the life itself of the whole organism.

Summing up, therefore, whether in the various sections of the organism (vascular system, interstitial spaces, cell), or in the corresponding sections of the kidney, the hydrosaline exchanges occur in schematic line in the reciprocal and alternating play of 3 fundamental forces: *hydrostatic pressure or blood pressure, dialysis sustained by osmotic pressure, and the highly definitive biological activity of the cell.* Naturally other factors, which we have already acknowledged, impinge upon these various phenomena; i.e., the acid-base equilibrium, the oncotic pressure of the proteins, the gaseous exchanges, etc. We know fairly well how the hydrosaline exchanges of the plasmatic section and of the interstitial liquids (i.e. of all the extracellular section) occur; we are still very ignorant about what occurs through the cell membrane and in the cell proper, representing the biological entity of life itself. All that we know is given us by the complimentary image of the phenomenology of the extracellular liquids and of the true and proper renal functions. Research on the renal function, on the urine, and on the extracellular liquids with the physiological and pathological variations of their hydrosaline exchange can, in part, disclose or at least indicate what occurs in the mysterious forge of the cell.

Now, if we may easily study and vary the balance of the internal environment, that is, the extracellular liquids, using the same forces and exploiting the same physio-chemical laws, we shall have in our possession a formidable instrument that, like a mirror, reflects to us what occurs in such an internal section of our organism, and consequently the possibility of studying and varying for experimental purposes or of correcting for therapeutical ends, the so-called internal environment. Here according to us, is what should be the purpose and the

value, the limits and the possibilities, of so-called extracorporeal dialysis. *Attempting a definition of what would be a perfect extracorporeal dialysis, we should say that it consists of the possibility of reproducing, outside of the organism, the same conditions of exchange which occur in the extracellular section of our organism, so that the maintenance of the constancy of the inner environment is in part transferred from the kidney to the dialyzer controlled and regulated by man himself.* Ideally, therefore, if we are sufficiently knowledgeable about it, the dialyzing apparatus should be the revealer and the regulator of the conditions of the internal environment. Here is why the problem, conceived in this manner, is no longer seen under the guise of an artificial kidney, which would be at the same time too much and too little, but as a simple extracorporeal hemodialysis.* The problem thus acquires not only a clinical and therapeutical value but certainly a high biological value.

What are the factors on which we may play in extracorporeal dialysis? Essentially two: hydrostatic pressure and osmotic pressure, and to these is added the oncotic pressure of the protein substance. By drawing off the blood of our organism in special tubes with a dialyzing wall having properties similar to that of the sanguineous vasa, tubes that are immersed in a saline solution, we reproduce the conditions existing in the extracellular liquids, which are dominated in large part, as we have already said, by the hydrostatic pressure of the blood, by osmotic pressure and by oncotic pressure of the proteins. Now, if we wish to confront the problem from a practical view-point, there are two determining factors for bringing about extracorporeal dialysis: *circulation* of the blood outside *of the organism* with all the related problems of hemodynamics, and *dialysis true and proper*, closely related to the property of the wall of the tube in which the blood runs, and to the composition of the bath.

B. HEMODIALYSIS

Up to now we have considered the problem of hemodialysis from a general view-point and we have explained how such a therapeutic instrument, according to us, might be used to restore a functionally regressive, altered electrolytic equilibrium. We shall now examine briefly, from a technical view-point, dialysis, extracorporeal circulation of the blood, the characteristics of our apparatus and our clinical experience.

In physiology *dialysis* means the process by which a colloidal solution (protein) frees itself from the salts dissolved in it. Dialysis through a cellophane membrane is governed by the same physical laws that control the passage of water and the substances dissolved in the plasma and in the interstitial liquids through the capillary wall on one side and the cellular membrane on the other. Naturally, however, both the capillary and the cell manifest a discriminative activity on the various substances that the cellophane membrane does not and cannot have.

The transportation of the water and the substances dissolved in the plasma is, therefore, in function with all those forces which act in liquid and on liquid. They are:

1. Hydrostatic pressure. By increasing or decreasing the pressure on the outside or on the inside of the filtrating membrane, the filtration increases in one direction or another.

2. Force of diffusion or osmotic pressure. The molecules of a substance dissolved in water are in continuous movement like the free molecules of a gas. Such movements generate the process of diffusion, performed through a membrane and proportional to the square root of the porosity of the membrane. Furthermore, every substance has its coefficient of diffusibility which varies in relation to (*a*) the temperature, (*b*) the percentage of the substance dissolved in the solution, and (*c*) permeability of the membrane.

3. Difference of electric potential. A difference in concentration between two solutions separated by a dialyzing membrane is caused by the shifting of ions, because a polarization is created and, therefore, a difference in the potential of the two sides of the membrane.

As in biology any cell presents in a functional sense a membrane which limits the protoplasm and which has different dialyzing properties, so in physiology there are different membranes.

There are two fundamental types of artificial membranes, viz. dialyzing membranes and semipermeable membranes:

1. Dialyzing membranes (parchment, cellophane, colloid) are permeable to water and crystalloids and impermeable to colloids (proteins). These are used in constructing dialyzers.

2. Semipermeable membranes (precipitated colloidals —ferrocyanide of copper) are permeable to water and more or less impermeable to all or part of the crystalloids, i.e., to the dissolved substances. Such membranes are used in making ultrafilters and are also commonly used to relieve the osmotic pressure exercized by a dissolved crystalloid. In fact, by not permitting the diffusion of this crystalloid towards the water, they oblige the water to pass into the solution and dilute the concentration of the crystalloid until the hydrostatic pressure produced counterbalances the osmotic pressure.

Between the type of dialyzing membrane that keeps back only proteins and the type of theoretical semipermeable membrane that keeps back also all the crystalloids, there is an entire intermediate range of membranes which behave in a special way with regard to one or more crystalloids.

In the artificial kidney dialyzing membranes are used which keep back only proteins, so that, wherever possible, either dialysis or osmotic and ionic equilibrium is obtained.

We will now examine those factors in whose function it is possible to modify dialysis. They are (1) the nature of the dialyzing membrane, (2) the shape of the dialyzing membrane (leaf or tubular), (3) the disposition of the membrane (in series or in parallel), (4) the output per minute of blood, (5) the dialyzing surface, (6) the composition, direction and temperature of the dialyzing bath, and (7) the means for maintaining or varying the water balance between the blood and the dialyzing

* 'Hemo'-spelling retained in this article.

bath (hydrostatic pressure, ultrafiltration, oncotic pressure).

1. *Nature of the dialyzing membrane.* As a rule, membranes of cellophane without imperfections and, at the moment of use, free of the glycerine which normally covers them, are used. Dialysis varies in function with the thickness of the membrane and with its porosity, inasmuch as the diffusion of the molecules and ions through it is inversely proportional to the square root of its porosity.

2. *Shape of the dialyzing membrane.* The dialyzers may use two types of cellophane membranes, leaf or tubular. As a matter of principle it seems that all researchers have become orientated in the use of tubular membranes, since dialyzers made with this type of membrane offer a greater guarantee of use, ease in setting up, and the certainty of a good distribution of blood in the dialyzer itself.

3. *Disposition of the dialyzing membrane.* Each type of membrane may be disposed either in series or parallel. The dialyzer in series is the type in which all the blood discharges per minute are extracted from the patient through the same section of a dialyzer. The dialyzing surface then functions according to the length of the cellophane (if tubular membranes are used) or in the number of dialyzer elements (if dialyzers of cellophane leaves are used). In the parallel dialyzer, on the contrary, the blood discharge per minute extracted from the patient is divided into equal parts in the diverse dialyzer elements placed parallel (whether they are tubular or leaf) and the dialyzing surface depends exactly upon the number and the length of the single elements. Whether in the series or the parallel system, the discharge per minute at the entrance of the dialyzer system will be equal to the final discharge per minute, and therefore the output of the parallel or series systems will be nearly equal.

4, 5, 6. *Output per minute of the blood. Surface of dialysis and discharge per minute of the dialyzing bath.*

It would be interesting to establish the variations in the output of the artificial kidney in relation to the variations of the discharge per minute of the artificial kidney, of the dialyzing bath and of the dialyzing surface, in order to be able to vary these elements so as to obtain in the most opportune manner the maximum output from the artificial kidney with the minimum injury to the patient. One may conclude that:

(*a*) To evaluate the output of the artificial kidney in experimental and clinical practice, one would do well to make full use of the index of dialysis;

(*b*) To evaluate the work accomplished by the artificial kidney in a unit of time one might make use of the index of extraction and of clearance. Such indices may be utilized advantageously when one wishes to make comparisons of the output in the unit of time. In the artificial kidney the concept that a greater clearance corresponds to a greater output is not valid. To the increase of the discharges per minute of the artificial kidney there corresponds a contraction of the clearance and of the index of extraction, while the index of dialysis and the dialyzer total are increased.

(*c*) An increase in the index of the dialysis corresponds to the increase of the discharges per minute of the artificial kidney, of the surface of dialysis and of the discharges per minute of the dialyzing bath.

(*d*) In special clinical conditions, however, it would be advisable to make as much use as possible of those variants of technique which have no influence on the condition of the patient (as the discharges per minute of the dialyzing bath) and to select those values of the discharges per minute of the artificial kidney and of the surface of dialysis that express, in these special conditions, the optimum output of the artificial kidney.

(*e*) It is possible to increase the output of the artificial kidney by altering the discharge per minute of the artificial kidney or the surface of dialysis, but such alterations may, for various reasons and under special conditions, not conform to the conditions of the patient.

In every case it will always be expedient to increase the volume of the discharges per minute of the dialyzing bath.

7. *Means of maintaining or varying the water balance between the blood and the dialyzing bath.*

In the artificial kidney, the dialyzing bath and the blood which circulates in the dialyzer system are separated by a disposing, dialyzing membrane which prevents the escape of the plasmatic proteins and permits, instead, the passage of diffusable substances (water and electrolytes). There is, therefore, the possibility of ionic exchanges through the cellophane membrane and the setting up, through this membrane, of an electrolytic equilibrium brought about through the osmotic exchanges which cause movements of water and salts when they are exactly controlled by the differences in ionic concentration between the blood of the extracorporeal circuit and the dialyzing bath. For this reason the cellophane membrane behaves analogously to the capillary wall, it also being permeable to water and to the electrolytes and almost impermeable to the proteins.

The force of attraction of the water by the proteins, so important in the physiolgy of the exchanges between plasma and interstitial liquids (which occurs through the side of the capillaries), intervenes also in the exchanges which occur between blood and dialyzing bath in the artificial kidney. It is, therefore, necessary to insert into the study of the artificial kidney the concept of the measure of the force of attraction of the water by the proteins as they occur in the exchanges between the plasma and interstitital liquids. The force of attraction of the proteins as creators of oncotic pressure is about 25-30 mm. of Hg, i.e. 30-40 cm. of water.

In the human body the exchanges of water through the capillary wall depends upon two contrasting forces; on one side a hydrostatic force, arterial pressure, which tends to make the water go out from the vasa and pass into the interstitial liquids, and on the other side oncotic pressure, which tends to keep back the water in the same vas. The water escapes from the vasa into the interstitial spaces or passes from the interstitial spaces to the capillaries, according to which of these forces prevails over the other. From the finalistic view-point, these intense exchanges of water between the blood and the tissues are not as important as the ones which occur on the level of the cellular membrane and on the level of the renal tubule.

All the extracellular liquids have the same ionic concentration and the same composition of azotase substances (expression of cellular catabolism). They represent the indispensable hyphen between the life of the cell and the excretory function.

The precise division of the extracellular liquids into two sections, plasmatic liquids and interstitial liquids, is accounted for by an exclusively technical problem, a problem of hydraulic necessity and irrigation. Even nature may find it difficult to irrigate every cell with a capillary; evidently for this reason the submerging of the cells in a transporting liquid (total extracellular liquid) was made necessary, but this liquid would be too static if it were not continuously agitated by a strong and continuous movement provoked by the differences between oncotic pressure and hydraulic pressure which occur on the level of a vascular tree, very diffused, indeed, but limited in the number of cells served.

In the artificial kidney the blood present in the cellophane membranes is consequently found in contact with a saline solution which surrounds it. It is found, that is, in the same conditions as the blood in the venous capillaries. Except that a failure in the dialyzer does not cause artificially hydrostatic pressure and a failure in the dialyzing bath, oncotic pressure. There is, therefore, present in the blood only oncotic pressure of the plasmatic proteins and attraction of water from the dialyzing bath to the blood.

The water balance between the blood in the cellophane and the dialyzing bath may be obtained in the artificial kidney in two different ways, viz.: (*a*) by hydrostatic pressure or ultrafiltration and (*b*) by the increase of the oncotic pressure of the bath:

(*a*) *Regulation by hydrostatic pressure or ultrafiltration.* If a hydrostatic pressure equal to the oncotic pressure of the proteins in the blood itself is produced in the blood contained in the dialyzer system, a water equilibrium between blood and dialyzing bath is obtained. If the hydrostatic pressure of the blood contained in the dialyzer is superior to the oncotic pressure of the proteins, there might be a passage of water from the blood to the bath with consequent hemoconcentration, i.e. dehydration. By analogously decreasing the hydrostatic pressure, hemodilution, i.e. hydration, may be obtained.

Some types of artificial kidneys are based upon hydrostatic pressure to maintain water equilibrium and to hydrate or dehydrate the blood circulating in the dialyzer system. They have in fact succeeded in causing a passage of water from the dialyzing bath to the blood, varying the hydrostatic pressure of the blood contained in the dialyzer from 5 to 30 cm. of water, and from the blood to the dialyzing bath by varying the hydrostatic pressure of the blood from 39 to 55 cm. of water. With the hydrostatic pressure varying from 30 to 39 cm. of water, a perfect water balance between the blood contained in the dialyzer and the dialyzing bath may be obtained. In fact, the hydrostatic pressure of 30-39 cm. of water balances the oncotic pressure of the plasmatic proteins, which is 25-30 mm. Hg.

Another system utilizing hydrostatic pressure to control the balance between blood and dialyzing bath is ultrafiltration. A marked depression is effected, both in the blood and in the dialyzing bath, with ultrafiltration, so that a passage of water and salts (plasmatic ultrafilter) is caused from the blood to the dialyzing bath.

(*b*) *Osmotic and oncotic pressure in the dialyzing bath.* By varying the oncotic pressure in the dialyzing bath, the water balance between blood and dialyzing bath may be controlled so as to keep the hydremia unaltered, increased or diminished. Some authors have met the problem by adding gum arabic or soluble amylum, but such studies were abandoned because these colloids did not guarantee sufficient purity or practicality and control of the value of pH in the salt solution was difficult. The same objective was also sought by raising the osmotic pressure of the dialyzing bath with high concentrations of glucose, but such studies did not achieve satisfactory results because if the amount of glucose added to the bath was too little, the osmolarity of the bath was not sensibly increased (and therefore obtained no effect), and if the amount of glucose was too high, there was an increase of glycemia (the glucose passed in effect easily through the cellophane membrane).

C. HEMODYNAMICS IN EXTRACORPOREAL CIRCULATION

In the artificial kidney, the characteristic techniques of extracorporeal circulation are of tremendous importance. The techniques of derivation and re-deposit of the blood from and to the patient are numerous and may be summed up as follows:

Arteria-vena derivation. The blood is drawn out from an artery and after having been dialyzed it is redeposited in the patient through a vein. Under such conditions it is the patient's heart which pushes the blood in the extracorporeal circuit (e.g. Alwall's kidney).

Arteria-vena derivation with the aid of a pump. The blood is drawn out of an artery and after having been dialyzed it is redeposited in the patient through a vein with the aid of a pump. The patient's heart pushes the blood in the first section of the extracorporeal circuit, dialyzer included, while a mechanical pump moves the dialyzed blood from the dialyzer to the venous bed (e.g. Merril's kidney).

Vena-vena derivation. Both the drawing out and redepositing of the patient's blood is done through the venous passage. The extracorporeal circulation of the blood, both in the extraction and redepositing sections, is assured by one or more mechanical pumps. This extraction and redeposit may be effected by using one vein (rhythmic alternating flux) or two veins (e.g., Battezzati-Taddei kidney).

In the 1st type of derivation cited (arteria-vena) it is practically impossible to regulate independently of each other the discharges per minute of the flux of extraction and redeposit. In the 2nd type of derivation (arteria-vena with the aid of a pump) the regulation of the amount of blood drawn out and of the amount redeposited will depend upon the coordination of the discharge per minute of the mechanical pump with that of the cardiac pump, and for this reason it is not feasible to achieve and maintain hydraulic equilibrium in the extraction and redepositing sections. In the 3rd type

of derivation (vena-vena), it will be necessary to co-ordinate properly the discharges per minute of the mechanical pumps to obtain hydraulic equilibrium.

D. TECHNICAL DESCRIPTION OF THE APPARATUS

On the basis of our direct experience with certain models of artificial kidneys made by us, and on the basis of studies by other authors who have been concerned with this subject, we have constructed in the last few months a new type of apparatus which corrects, according to our view-point, some of the characteristics in the preceding apparatus which did not satisfy us.

We shall observe some particular aspect of the problem, taking as standards of comparison some of the models of the artificial kidney most widely used today in clinical practice, viz. Kolff's kidney, achieved by the A.C.M.C., Alwall's kidney, and the third (1954) model of our artificial kidney. In the first place we shall examine *the problem of hemocirculation*.—Kolff's kidney is based principally on the coordination of the arterial flux of the patient with the discharges per minute of the mechanical pump designed for the re-introduction of the blood after dialysis. It seems clear to us that, although maintaining an extracorporeal hydraulic balance under such conditions is possible, it is somewhat questionable and delicate. In fact, a loss of control may easily be the cause—especially in a system like Kolff's, which uses a free dialyzer—of interference between the two circulatory divisions, corporeal and extracorporeal, with immediate repercussions on the circulatory hemodynamics of the patient. In any case,

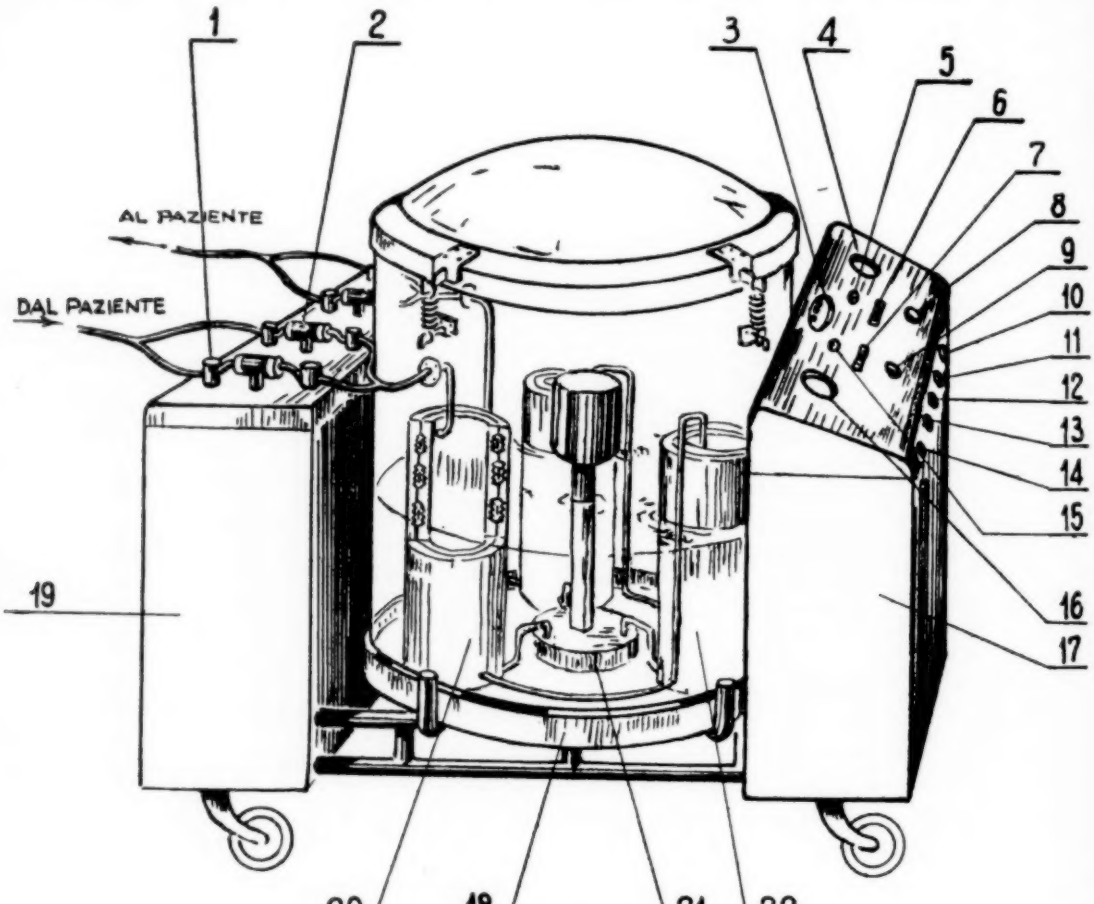

Fig. 1. Artificial kidney, new model. (1) Electro-valve. (2) Blood pump. (3) Counter. (4) Thermo-regulator. (5) Control lamp. (6) Blood flow (c.c./minutes) indicator. (7) Water flow (c.c./minutes) indicator. (8) Regulation of blood flow. (9) Regulation of water flow. (10) Water-heater switch. (11) Blood-pump switch. (12) Main switch. (13) Blood-pump switch. (14) Vacuum-pump switch. (15) Control lamp for battery charge. (16) Regulator vacuum-gauge. (17) Container for buffer-batteries, transformer and control board of the apparatus. (18) 'Perspex' container with 3 dialyzers coupled in series and pump for dialysis bath. (19) Container for the reducing motor and blood-pump engine. (20) Cross-section of the dialyzer. (21) Water pump. (22) Dialyzer.

by comparison with that of Alwall, Kolff's system presents some advantages which we consider rather important.

Alwall did not use any pump for the course of blood in the dialyzer, but only the arterial *vis a tergo*. Alwall's dialyzer differs notably from Kolff's in that the tubular cellophane membrane is compressed between two areas and, by not being able to dilate beyond given limits, prevents the setting up of a hemorrhage caused by the apparatus. Under such conditions the arterial blood circulates in all the closed circuit and returns to the venous circle of the patient. This method, however, does not allow a control of the amount of blood that passes in the dialyzer in unit time, or modification of the discharge per minute at will according to the circumstances.

Moreover both types of apparatus, Kolff's and Alwall's, present the serious inconvenience, according to us, of having to sacrifice an artery of considerable importance. Basing ourselves precisely on the total of these observations, we first achieved (model III 1954 artificial kidney Battezzati-Taddei) a system of hemocirculation which utilized, for taking out and putting back of blood, one or two venous passages. A rotating pump on rollers allowed a variation of discharges per minute varying from 10 to 200 c.cm. In such manner, with the extracorporeal circle filled with a donor's blood, the patient's circle is in a condition of complete independence from the extracorporeal circle. Many important advantages over the techniques described above were thus obtained. Clinical experiment conducted in the meantime has, however, shown us that it is possible to bring some important modifications to this system. Indeed, today we maintain that, in an extracorporeal circulation technique that is prolonged for several hours, any element whatsoever that may influence the cardiac dynamics, even in a limited way, must be eliminated. In line with this principle, we have today abandoned the system of rhythmic aspiration and reintroduction of the blood in the patient. With such a type of derivation, the patient's heart must, indeed, work in rhythmatically unstable conditions—in one period with a greater venous discharge and in the succeeding period with a diminished discharge.

The system achieved by us today (Fig. 1) allows a complete equalization of the amount of blood drawn out and put back contemporaneously through two different catheters or through one catheter with a double body. The control of the discharges per minute is absolutely secure since—the capacity of the blood contained in the small lungs (*a*), (*b*), (*c*) and (*d*) being constant—the variations of the discharge depend exclusively on the variations of the pulsating rhythm of the same. This indirect control of the discharges per minute is, we repeat, of very marked clinical interest.

Having examined the various types of derivations and propulsion of blood, we shall now examine *the problem of the dialyzer*. We shall take always as standards of comparison the dialyzers of the 3 artificial kidneys used the most in clinical practice (Kolff, Alwal, Battezzati-Taddei). All three of these dialyzers use the tubular cellophane as a dialyzing element. In Kolff's dialyzer the tubular membrane is used in one thickness (dialyzer in series) wound in close spirals on a horizontal rotating cylinder. The same is true of Alwall's dialyzer but, while in Kolff's the tubular membrane is free, in Alwall's it is compressed by a mantle in a section fixed beforehand so that it cannot dilate and, moreover, the cylinder is vertical and immovable. In the 1954 model of the Battezzati-Taddei dialyzer, the tubular membranes are placed parallel, free in a dialyzing bath.

Of these 3 dialyzers, the most rational from a practical view-point is surely Alwall's, since the fixed position of the cellophane tube has prevented hemorrhages caused by the apparatus, i.e., the excessive filling of the tubular membrane with the patient's blood that may be the cause, evidently, of the decompensation in the circulatory dynamics of the patient. On the contrary, in Allwall's dialyzer, again from our view-point, the circulation of the dialyzing bath is not satisfactory. This type of dialyzer, however, offers the advantage of being able to practice ultrafiltration inasmuch as it is closed in a perfectly air-tight container.

In Kolff's dialyzer it is not possible to effect ultrafiltration, and moreover the open system does not assure us of the constancy of the quantity of blood contained in the dialyzer itself. The rotation of the cylinder, however, in contrast to Alwall's dialyzer, assures a better utilization of the dialyzing bath since the blood runs against the current to the dialyzing bath itself.

In the dialyzer model 1954 Battezzati-Taddei it is not possible to effect ultrafiltration, and it is difficult to maintain constant the blood contained in the dialyzer itself. The utilization of the dialyzing bath is, on the contrary, excellent, since it runs against the current in the direction of the blood.

By considering all these elements, we have achieved a dialyzer which offers noteworthy guarantees of use and output. It utilizes as always the tubular cellophane membrane as dialyzing element, wound on 3 cylinders connected in series. All 3 of the cylinders are protected by a mantle which permits exact control of the amount of blood contained in the dialyzer. The dialyzing bath runs against the current for the entire length of the tubular membrane. The 3 cylinders are placed in a perfectly water-tight recipient so that it is possible to effect ultrafiltration (Fig. 1).

E. CLINICAL EXPERIENCE

In Table I we sum up the results achieved with hemodialysis. Even in its limitations, our experience may give some useful clinical indications. We realize, however, that it is incomplete. We have divided the morbid processes according to Allen's scheme into (1) glomerulonephritis, acute and subacute, (2) tubular nephrosis

TABLE I

	No. of cases	*No. survived*
Glomeruleonephritis, acute and subacute ..	6	4
Tubular Nephrosis:		
Lower nephron nephrosis	1	0
Nephrosis of the proximal nephron ..	3	1
Chronic glomerular nephritis	6	1
Nephrosclerosis	1	0
Polycystic kidney	1	0

of the lower nephron and (3) nephrosis of the proximal nephrons, (4) chronic glomerulonephritis, (5) nephrosclerosis and (6) polycystic kidney.

On the basis of our limited statistics we may affirm that, as a general rule, hemodialysis can be carried out in renal insufficiencies in which the lesion is prevailingly glomerular, and chiefly in the acute forms, while only negative results can be registered in the chronic forms, given irremediable irreversibility of the lesion. Renal insufficiencies attributable to alteration of the tubules may be greatly relieved. In a case of polycystic kidney or nephrosclerosis, no result can be expected from hemodialysis.

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NATIONAL NUTRITION COUNCIL

RECOMMENDED MINIMUM DAILY DIETARY STANDARDS

COMPILED BY THE DIETARY STANDARDS COMMITTEE OF THE COUNCIL

1. In 1935, the League of Nations[1] made the first attempts to define man's daily requirements of specific nutrients in quantitative terms. The Committee on Foods and Nutrition of the United States National Research Council published a much more detailed table in 1941 which was adapted to South African conditions by the National Nutrition Council in the following year. The American figures were revised in 1945, 1948 and again in 1953. In 1953 the National Nutrition Council of South Africa decided to revise its own standards and in the present report the existing knowledge of the subject is applied to the somewhat unusual circumstances of a country with a mixed population that varies greatly in its dietary habits and occupations.

Existing Standards

2. The Dietary Standards of the Food and Nutrition Board of the National Research Council (NRC) of the USA are recommendations and not requirements 'since they represent, not merely minimal needs of average persons, but nutrient levels selected to cover individual variations in a substantial majority of the population. . . . The nutritive intakes recommended are, in general, higher than the average requirements and lower than the amounts which may be needed in pathologic states or in rehabilitation following depletion'.[2]

3. The figures given by the Committee on Nutrition of the British Medical Association, 1950[3] are intended to be adequate for the maintenance of a good nutritional standard for healthy persons. These standards also do not make provision for sickness or convalescence.

4. The standards of the Canadian Council on Nutrition (1950) are even lower than the British, and serve as a basis for determining food supplies of groups, and can also be used for judging the adequacy of the food intake of individuals, or groups. 'They also indicate a nutritional floor beneath which maintenance of health in people cannot be assumed'.[4]

5. In 1950 a Committee of the Food and Agriculture Organization FAO recommended methods that may be followed in assessing calorie requirements. Their recommendations are designed for application to countries or groups within countries. It is emphasized that the recommendations are not directly applicable to individuals and, even when applied to groups, local circumstances must be considered. The Committee considered requirements at the 'physiological level'; their recommendations represent the needs of healthy individuals and are 'set at such levels as to make possible an active life and a high degree of productivity in occupational pursuits'. They are based on a 'reference' man (weight 65 kg., 143 lb.) and woman (weight 55 kg., 121 lb.), aged 25 years living at a mean external annual temperature of 10°C (50°F). Suggestions are made for calculating the requirements of individuals differing from the 'reference' in respect of body size, age, activity and environmental temperature.[5]

General Principles

6. There is no evidence of racial differences in the requirements of nutrients; consequently no distinction between the standards proposed for Whites and non-Whites has been made in the table.

7. The nutrient requirements of individuals are influenced by sex, age, activity, ideal weight and other factors. If actual weight be taken as the basis, a corpulent person will gain weight owing to the higher calorie-allowance provided, whereas the needs of an underweight person will not be adequately met. If ideal weight for height, activity or body surface could be used as the criterion, the calorie requirements could be assessed more accurately; unfortunately adequate data for South Africa in this respect are lacking.

8. The close relationship or interaction of the different nutrients is a subject of much research. The intake of one nutrient probably affects the requirements of others. Thus the thiamin requirement is determined by the calorie content of the diet; both folacin and vitamin B_{12} play a part in the synthesis of choline, which is essential for the maintenance of liver morphology and function; vitamin D promotes the absorption and metabolism of calcium; a deficiency of niacin occurs particularly in diets low in complete proteins—such proteins provide the essential amino acid tryptophane, which is a niacin precursor.

Use and Limitation of Dietary Standards

9. It is most important to remember that dietary standards cannot be used as the only criterion for judging the nutritional state of a person or group, and that failure to comply with these standards will not necessarily lead to deficiency diseases.

10. In this connection the following quotations are of interest:

'Inasmuch as many persons who receive less than the recommended allowance of one or another nutrient may remain in health through long periods, it becomes apparent that these allowances are not to be used as the sole criterion for judging the state of nutrition of any population.'[6]

'If these allowances are used in dietary evaluation, it is essential to appreciate that, while most persons whose consumption equals or exceeds the goals are presumably adequately nourished, not all persons who fail to reach these goals are malnourished.'[2]

'It is important that standards should be correctly applied and their limitations recognized. In the past some of the conclusions drawn from the comparison of nutrition intake levels with the dietary standards have been far from valid. If the results of a dietary survey show that the diet has a very low calorie content, the conclusion that the group in question is suffering from undernutrition is perhaps a legitimate one. But the fact that the intake of certain nutrients falls below some recommended allowance does not justify the conclusion that a proportion of any group surveyed is suffering from malnutrition. In such circumstances the possible presence of malnutrition may be inferred, but the dietary survey *per se* provides no evidence of its existence.

The value of the information is that it indicates where further investigation may be needed and which dietary defects need most consideration in food and nutrition programmes.'[7]

Proposed Dietary Standards for South Africa

11. The standards proposed here should be regarded as adequate for the maintenance of health without allowing for a safety margin for ill-health, or for great individual differences in absorption and metabolism. The physical changes of the normal body with age and activity have been taken into consideration; for example, from the age of 10 years the requirements of boys and

girls are considered separately, because of differences in weight, activity and earlier changes in girls than in boys.

12. The figures given are for nutrients in foods as consumed and do not allow for losses during transport, storage, preparation or serving. Little is known regarding the extent of these losses. It is probable that little or no loss of protein or carbohydrate usually occurs but with certain methods of cooking, e.g. broiling and roasting much loss of fat may occur. Mineral salts, e.g. calcium, can be leached out of vegetables during cooking in water. The losses in vitamins may be very high, especially of ascorbic acid. Figures from the literature show the following average losses in vegetables during cooking, depending on the

TABLE I. RECOMMENDED MINIMUM DAILY DIETARY STANDARDS

	Calories (*a*)	*Protein* g.	*Calcium* g.	*Iron* mg.	*Vit. A* I.U.	*Thiamin* mg.	*Riboflavin* (*o*) mg.	*Niacin* (*q*) mg.	*Ascorbic Acid* mg.
Man (average weight 160 lb.)									
Moderately active	3,000	65	0·7	9	4,000 (*k*)	1·0	1·6	15	40
Sedentary Worker	2,300	65	0·7	9	4,000 (*k*)	0·8	1·6	12	40
Heavy Worker ..	4,500	65	0·7	9	4,000 (*k*)	1·6	1·6	18	40
Woman (average weight 130 lb.)									
Moderately active	2,300	55	0·6	12	4,000 (*k*)	0·8	1·4	12	40
Sedentary Worker	2,000	55	0·6	12	4,000 (*k*)	0·7	1·4	11	40
Heavy worker ..	2,800 (*b*)	55	0·6	12	4,000 (*k*)	1·0 (*b*)	1·4	15 (*b*)	40
Pregnancy, last trimester	(*c*)								
Moderately active	2,600	80 (*g*)	1·5	15	5,000 (*l*)	0·9	2·0	14	55
Sedentary worker	2,200	80 (*g*)	1·5	15	5,000 (*l*)	0·9	2·0	13	55
Heavy worker ..	3,200	80 (*g*)	1·5	15	5,000 (*l*)	1·1	2·0	15	55
Lactation	(*d*)	80 (*g*)	(*i*)	15	6,000 (*l*)	(*n*)	(*p*)	15	55
Children									
0–3 months ..	55 cal/lb.	1·6 g/lb. (*h*)	0·8 (*j*)	6 (*h*)	1,500 (*m*)	0·2	0·5 (*h*)	2 (*r*)	20 (*s*)
4–9 months ..	50 cal/lb.	1·6 g/lb. (*h*)	0·8 (*j*)	6 (*h*)	1,500 (*m*)	0·3	0·8 (*h*)	4	25 (*s*)
10–12 months ..	45 cal/lb. (*e*)	1·6 g/lb. (*h*)	0·8 (*j*)	6 (*h*)	1,500 (*m*)	0·35	0·9 (*h*)	4	4 (*s*)
1–3 years ..	1,100	40	0·6	7	2,000 (*l*)	0·4	1·0	6	40
4–6 years ..	1,500	45	0·7	8	2,500 (*l*)	0·5	1·1	8	40
7–10 years ..	1,900	55	0·8	10	3,000 (*l*)	0·7	1·4	10	40
Girls									
10–12 years ..	2,400 (*f*)	70	1·0	12	3,000 (*l*)	1·0	1·8	12	40
13–15 years ..	2,600	75	1·2	15	4,000 (*l*)	1·1	1·9	15	40
16–20 years ..	2,400 (*b*)	70	1·2	15	4,000 (*l*)	1·0 (*b*)	1·8	15 (*b*)	40
Boys									
10–12 years ..	2,400	65	0·8	12	3,000 (*l*)	1·0	1·6	12	40
13–15 years ..	3,000	75	1·3	15	4,000 (*l*)	1·2	1·9	15	40
16–20 years ..	3,700	90	1·3	15	4,000 (*l*)	1·5	2·3	15	40

(*a*) Although a single figure is given in each instance, it must be regarded as an average around which there is an individual range. In any case the calorie allowance must be adjusted to the needs of the individual so as to achieve and maintain his desirable weight (see Table II).
(*b*) In the case of female heavy workers, e.g. those working in the fields, this value may have to be appreciably increased.
(*c*) The basal metabolic rate of the mother is not altered by pregnancy and the increased metabolic requirements are due to the foetus and increased weight of the mother.
(*d*) Add 120 calories for each 100 ml. of milk produced, e.g. at 1 month the average milk production is about 700 ml. and allowance should be made for 840 calories. At 4 months production is about 1 litre and allowance should be made for 1,200 calories.
(*e*) For groups under 1 year allow approximately 1,000 calories.
(*f*) Allowance has been made for lesser activity compared with boys but this is balanced by greater need because puberty changes set in earlier.
(*g*) An additional allowance of 25 g. is made both for pregnancy and full lactation; half of the allowance should be derived from animal sources.
(*h*) The recommendation for infants pertain to protein, iron, etc. derived primarily from cow's milk or commercial milk-preparations.
(*i*) Add 120 mg. calcium for each 100 ml. of milk produced; e.g. at 4 months the allowance would be 1·2 g.
(*j*) Where breast milk is not being used.
(*k*) Assuming that 1/3rd is present as vitamin A, or 5,000 I.U. if 1/5th is present as vitamin A.
(*l*) Preferably 1/3rd in each case as vitamin A.
(*m*) There is evidence that the intake of vitamin A from breast milk, though highly variable, is approximately 2,000 I.U. at 2 months and 2,500 I.U. at 4 months, but it is not yet established that these intakes are necessary.
(*n*) Allow 0·4 mg. for each additional 1,000 calories—see (*d*).
(*o*) See paragraph 26.
(*p*) For full lactation the allowance should be 2·0 mg. riboflavin.
(*q*) See paragraph 27.
(*r*) This figure is based on the known concentration of niacin in breast milk and bearing in mind that pellagra amongst children reared entirely at the breast is unknown.
(*s*) Based on the vitamin C concentration in breast milk.

TABLE II. RELATIONSHIP BETWEEN CALORIE REQUIREMENTS AND DESIRABLE WEIGHT [5]

Weight lb.	Weights: Man Calories	Man Percentage of allowance for reference man	Woman Calories	Woman Percentage of allowance for reference woman
240 ..	4,035	135		
230 ..	3,912	130		
220 ..	3,787	126		
210 ..	3,660	122		
200 ..	3,532	118	3,151	137
190 ..	3,402	113	3,034	132
180 ..	3,271	109	2,918	127
170 ..	3,137	105	2,798	122
160 ..	**3,000**	**100**	2,677	116
150 ..	2,863	95	2,554	111
140 ..	2,723	91	2,423	105
130 ..	2,579	86	**2,300**	**100**
120 ..	2,433	81	2,170	94
110 ..	2,283	76	2,036	88
100 ..	2,125	71	1,900	83
90 ..	1,972	66	1,759	77
80 ..	1,809	60	1,614	70

Reference man: 160 lb. **Reference woman: 130 lb.**

method employed.[8] The low figure is for waterless cooking and the high one when the foodstuff is covered with water. Losses are due to leaching (riboflavin and niacin), actual destruction (ascorbic acid) or both (thiamin):

Carotene	5—21%
Thiamin	9—37%
Riboflavin	12—37%
Niacin	9—41%
Ascorbic Acid	27—47%

Ascorbic acid is progressively destroyed by an oxidizing enzyme liberated in many fruits and vegetables after they have been picked. It is thus most desirable that the interval between picking, preparing and serving these products be as short as possible.

13. The weight of the average South African man or woman is not known, but it has been decided to adopt the arbitrary figure for the reference man of 25 years of 150 lb. (73 kg.) and for the reference woman of the same age, of 130 lb. (59 kg.).

Adjustments of calorie requirements for weights other than those of the reference man and woman are given in Table II.

14. In the higher age-groups, especially when the occupation is sedentary, the calorie intake from both carbohydrate and fat sources can be reduced with advantage in order to prevent obesity and certain degenerative diseases, but the intake of other nutrients should not be reduced. On the contrary, because the body changes from the anabolic to the catabolic state, the nutrient intake other than carbohydrate and fat may well need to be increased rather than decreased.

15. As is well known the requirements during pregnancy and lactation are higher than those for non-pregnant and non-lactating women. In some instances (e.g. calories, protein, calcium) it is possible to calculate the additional needs from the known composition of the products of conception or of breast milk. In the case of many other nutrients, little is known of their requirements, though it is generally agreed that they should be increased.

Calories

16. Since external temperature affects calorie requirement, extreme variations must be taken into consideration. An average temperature of 60°F has been used in drawing up these standards, following the adjustments for external temperatures made by FAO.[5]

17. At 1 year the requirement is approximately 45 calories per lb. body weight (100 cals/kg). Beyond this age the growth rate decreases and the requirement per unit of body-weight drops accordingly.

Under 10 years the calorie requirements of boys and girls are considered to be the same. Above this age they are assessed at different levels. During the period of puberty and adolescence increased appetite is often very striking. Provided physical activity is high this increased appetite should be met by increased intakes of calorie-producing and other nutrients to levels often reaching those required by heavy-labouring adults.

Labourers in this country require relatively more calories than the American labourer since in the latter country greater use is made of labour-saving devices.

18. There is a growing view that gain in weight after maturity (25 years) is not physiological and should be avoided. The middle-age weight gain is largely due to an increase in the proportion of fat in the body and is not accompanied by a gain in active protoplasmic mass but may even be accompanied by a loss thereof. The reason for the decrease in active protoplasmic mass in middle-age may be partly endocrinological in origin, but is almost certainly due in part to decreasing activity; therefore, calorie intake should be reduced with advancing age. The recommendation of the Food and Nutrition Board of the USA for a reduction of 5% for each decade is accepted.[2] On this basis the average requirement for 35, 45, 55 and 65 years would be 95%, 90%, 85% and 80% respectively of the calorie requirement at 25 years.

Protein

19. The view that a person requires less protein than previously thought necessary is rapidly gaining ground.[9,10]. It is important however, that where the diet consists predominantly of cereals, such as wheat and maize, it must be supplemented by either animal foodstuffs or legumes, and that where maize is chiefly used, the protein standard must be slightly raised. In view of the importance of protein for body-building and functioning and for protection against tuberculosis and possibly other infections, it is advisable that the standard for the adult male should not be lower than 65 g., of which at least 1/3rd should be of animal origin, which can be partly replaced by protein from dry legumes. Dean[11] considers that a cereal-legume mixture may largely replace milk protein in the diet of children.

When calorie requirements are not met some of the protein is metabolized to provide the deficit, hence less is available for body-building, protection and regulation.

20. The protein requirement during the 3rd trimester of pregnancy and breast feeding is considerably higher and, because of the necessity to manufacture complete protein, the animal protein allowance is increased to 40% of the total.

21. In the child the requirement per unit of body-weight is higher than in the adult, and the quality of protein is of even greater importance. In the last decade it has been customary to recommend that the protein intake of a child under 1 year should be 3·5 g. per kg., or 1·6 g. per lb. of body-weight, expressed in terms of cow's milk protein. More recently, views expressed at a Conference on protein requirements (Josiah, Macy, Jnr. Foundation with FAO. and WHO. of UNO, June 19-24 1955, Princetown, New Jersey, (USA.) indicate that this figure may be unnecessarily high. The conclusions arrived at, and more especially the evidence on which they are based, are not available to the Committee. The suggested lower standards are also expressed in terms of cow's milk protein only and no equivalents are yet available for other animal proteins or for vegetable proteins. The Committee has, therefore, adhered to conventional standards.

Calcium

22. There is increasing evidence that the human body adapts itself to live economically and effectively at levels of calcium intake considerably lower than the usually recommended allowances.[3] In South Africa among the indigenous population, intakes are often 1/3rd of such allowances with no apparent ill effects. Unfortunately, there is no method of determining the level of calcium stores in the body. Furthermore, in strong contrast to other nutrients the intake of which is recommended here, there appears to be no evidence of any syndrome caused solely by calcium deficiency, or remediable by calcium supplementation only. To recommend allowances of a dietary constituent to protect against unspecified stigmata appears to be a questionable procedure. However, there is evidence from metabolic studies on well-nourished White people, that there is a tendency for a negative calcium balance to occur if the intake is below 10 mg. calcium per kg. of body-weight per diem. In the light of our present knowledge

it has been decided, therefore, to recommend this level of intake for the adult man and non-pregnant and non-lactating woman.[12]

The recommended calcium allowances in pregnancy and lactation are calculated from the amounts needed to supply the foetus and to maintain the calcium level in the breast milk. The standards for children have been calculated from the accretions of calcium in the body during growth as reported in the literature.

Iron

23. The precise requirements for iron are not well established but it is known that the incidence of iron deficiency or of hypochronic anaemia is higher in women than in men. If the intake of other nutrients is satisfactory there is no difficulty in obtaining the level of iron recommended. An additional 3 mg. per diem has been shown to be required during pregnancy. There is evidence that a considerable percentage of Bantu people receive a theoretical excess of iron in the diet from the use of iron pots.

Vitamin A

27. Vitamin A can be present in the diet in the form of its precursor carotene or as the active vitamin A. It will, therefore, be referred to either as carotene or vitamin A. One I.U. of vitamin A is equivalent to 0·3 micrograms of vitamin A alcohol or to 0·6 micrograms of β carotene. Owing to the uncertainty of the degree of conversion of carotene to vitamin A, it is desirable that a portion, perhaps as much as 1/3rd, should be present as vitamin A. When this is not practicable a more generous allowance of carotene is desirable.

Thiamin

25. The consensus of opinion seems to be that adults require a minimum of 0·23 mg. of thiamin per 1,000 calories. This standard is easily attained with diets containing unsifted or enriched cereal foods or an abundance of high-quality protein. It has been found that 0·35 mg./1,000 cal. is sufficient to allow of tissue storage.[13] Because of the greater demands of pregnancy and lactation the allowance should be slightly higher than 0·35 mg/1,000 cal. during this period. For children the thiamin allowance is also based on calorie intake. During puberty and adolescence an extra allowance is made to meet the higher physiological requirements.

Riboflavin

26. Although it has not been established that the requirement of riboflavin is related directly to protein requirement, it has been decided to adopt the NRC recommendation[2] of equating 0·025 mg. riboflavin per g. of protein.

Niacin

27. The metabolic pathways of tryptophane and niacin are intimately related. Although it is generally accepted that niacin requirements are approximately 10 times those of thiamin, these allowances have been increased because of the dietary pattern of the majority of the inhabitants of this country, whose tryptophane intake is apt to be low.

Ascorbic acid

28. Ascorbic acid is the most sensitive of the vitamins to oxidation and heat and a high percentage may be destroyed during transportation, storage and preparation of vegetables and fruit.

There is a close relationship between ascorbic acid and other nutrients, e.g. those responsible for tissue formation and maintenance and for development of the blood cells. Furthermore, the supply of ascorbic acid may be seasonal in parts of the country. The recommended allowances are, therefore, placed at levels higher than the Canadian figures, but considerably lower than those of the National Research Council[2] of the USA which have been regarded as unnecessarily high.[14]

Vitamin D

29. Vitamin D is essential for the absorption and metabolism of calcium and phosphorus. When there is reason to believe that exposure to sunlight is inadequate or that the sunlight is less active (as in the Western Cape during winter) a therapeutic intake of 400 I.U. per diem may be prescribed for infants, and pregnant or lactating women. Extensive use of unrefined cereals containing phytic acid, which may interfere with the absorption of calcium, is an additional reason for vitamin D therapy.

Consideration of Nutrients not Tabulated

30. *Fat.* It is suggested that the fat level in the diet should be 20-30% of the total calorie intake, and for children, adolescents and, possibly, very active adults, it should constitute 30-40% of the calories. Under conditions of economic privilege there is a tendency towards undesirably high fat-intakes which, it is claimed, are potentially dangerous, at least in middle age and in sedentary occupations. According to some authorities the upper desirable limit for fat intake under these conditions is probably about 30% of the total calories. The possible requirement of the essential fatty acids (linoleic, linolenic and arachidonic acids) are easily covered where fat provides 20% or more of the calories.

31. *Carbohydrates.* Among Western populations, carbohydrate usually supplies less than half of the energy value of the diet. However, among the poorer sections of such populations, and also among tropical and semi-tropical populations generally, carbohydrate may contribute 3/4ths or more of the calorie requirements. Under such conditions, the present practice of refining cereals (the main source of carbohydrate) to produce a flour of improved appearance, palatability and keeping quality, is to be deplored. Not only is protein quality reduced, but there are losses of certain mineral salts and vitamins; in particular, thiamin is lost and this nutrient, together possibly with other nutrients, is essential for carbohydrate metabolism.

32. *Pyridoxine and the other members of the Vitamin B Complex.* No allowances have been made for these vitamins because it is considered that there should be no deficiency of other members of this group if adequate provision from natural sources is made for proteins and the B vitamins already mentioned.

The Dietary Standards Committee of the National Nutrition Council: F. W. Fox (Chairman), J. F. Brock, J. T. Irving, W. A. Odendaal, A. R. P. Walker, J. M. Latsky, A. J. du Plessis, L. J. Louw (Miss).

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AKADEMIESE AANSTELLINGS : UNIVERSITEIT VAN STELLENBOSCH

Die keuse van die drie kliniese professore* is uit 'n groot getal applikante uit Suid-Afrika, Holland, Duitsland, Engeland, Amerika en Italië gemaak.

Alhoewel die aanstellings van die kliniese professore nou reeds gemaak is, sal daar nie nou al studente in die senior klasse wees nie wat die hoofvakke Interne Geneeskunde, Chirurgie en Ginekologie loop nie. Eers vanaf hul vierde jaar sal die studente hierdie vakke studeer. Die aanstellings moet egter vroegtydig gemaak word omdat die eerstejaarklasse volgende jaar 'n aanvang neem en omdat die professore ook op die geneeskundige staf van die Karl Bremer-hospitaal moet dien. Terselfdertyd was dit nodig om vroeë aanstellings te maak ten einde 'n fakulteit te hê om behulpsaam te wees met die beplanning van 'n groot nuwe hospitaal wat op Parow gebou sal word, waar die Geneeskundige Fakulteit met verloop van tyd gevestig sal word.

DR. F. D. DU T. VAN ZYL

Dr. F. D. du T. van Zyl is aangestel as Hoogleraar in die Departement van Snykunde en deur die Senaat gekies tot Dekaan van die Geneeskundige Fakulteit. Hy is gebore in 1902, op die plaas van Zylsdamme, Ladismith, Kaap.

Dr. F. D. du T. van Zyl

Nadat hy tot standerd VII op die plaas skool gegaan het, het hy na die Hoërskool Montagu gegaan, waar hy gematrikuleer het. Nadat hy sy M.B., Ch.B. graad in Kaapstad in 1925 verwerf het, het hy 'n aanstelling in die Somerset-hospitaal aanvaar. Daarna het hy vier jaar lank in die algemene praktyk op Vredenburg gestaan. Toe het hy in Europa gaan spesialiseer in die snykunde en het in verskillende hospitale in Engeland asook op die Vasteland gewerk. Terug in Suid-Afrika het hy sy Meestersgraad in Chirurgie met onderskeiding aan die Universiteit van Kaapstad behaal—die eerste student om hierin te slaag. Hierna het hy twee jaar lank op Malmesbury praktiseer en het hom toe as spesialiteit in Kaapstad gevestig. Gedurende al die jare wat hy in die praktyk in Kaapstad is, was hy ook dosent in Chirurgie aan die Universiteit van Kaapstad. Hy is terselfdertyd een van die Senior Chirurge aan die Groote Schuur-hospitaal.

In sy kapasiteit as hoogleraar in Snykunde sal hy ook hoof van die Departement Snykunde wees en Senior Chirurg aan die Karl Bremer-hospitaal te Bellville, waar die Stellenbos-se geneeskundige Fakulteit gevestig sal wees. Hy sal terselfdertyd met sy privaat praktyk voortgaan en sal die eerste paar jaar ook nog sy klasse aan die Universiteit van Kaapstad kan voortsit. Hy sal in Kaapstad bly woon.

Sy professionele aanstellings sedert 1936 het die volgende poste ingesluit: Registrateur in Ortopedie, Somerset-hospitaal; Registrateur in Chirurgie, Groote Schuur-hospitaal; Assistent van die Professor van Chirurgie, Universiteit van Kaapstad, en Assistent-Chirurg, Groote Schuur-hospitaal, en later Chirurg aan die hospitale Groote Schuur, Somerset en Conradie. Dr. van Zyl het verskeie verhandelinge gepubliseer, en verskeie mediese kongresse toegespreek.

Wanneer Dr. van Zyl gevra word welke ondervindinge hom meesal gehelp het in sy chirurgiese praktyk, dan is hy onmiddellik gereed met die antwoord: ‚My ondervinding in die algemene praktyk het my geleer om dinge raak te sien, wat ek anders sou gemis het . . . en my groot leermeester professor C. F. M. Saint. Hy het my die beginsels van chirurgie op 'n wyse geleer soos niemand anders kon doen nie. Ek was bevoorreg om deur hom opgelei te word. In my onderwys volg ek graag sy metodes'.

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DR. J. N. DE VILLIERS

Dr. J. N. de Villiers van Kaapstad is aangestel as Professor in Verloskunde en Ginekologie. Hy is 32 jaar oud, en was gebore op Beaufort-Wes. Dr. de Villiers het sy M.B., Ch.B. graad in 1946 aan die Universiteit van Kaapstad behaal, met onderskeiding in die finale professionele eksamen. In 1954 het hy die graad M.O. en G. behaal.

Dr. J. N. de Villiers

Dr. de Villiers het sy ondervinding in die volgende aanstellings opgedoen: Huisdokter in Chirurgie en later Interne Geneeskunde aan die Groote Schuur-hospitaal; algemene praktyk tussen 1948 en 1952 te Calvinia, waar hy later deeltydse Mediese Superintendent van die Voortrekker-hospitaal was; Registrateur in Verloskunde en Ginekologie, Groote Schuur, en later voltydse assistent in sy vak aan die Groote Schuur-hospitaal. Tussen 1952 en 1955 het hy teoretiese en kliniese onderrig gegee aan studente aan die Universiteit van Kaapstad.

Dr. de Villiers het verskeie beurse ontvang, soos die Murray Gift Scholarship en 'n medalje in Farmakologie van die Universiteit van Kaapstad. Sedert 1954 is hy besig met navorsing waarvoor hy 'n toelaag van die C. L. Hermann-navorsingsfonds gekry het. Verskeie artikels het al onder sy naam verskyn, meestal in hierdie Tydskrif. Dr. de Villiers is tans in Londen, waar hy studeer op 'n Nuffield Dominion Travelling Fellowship.

DR. A. J. BRINK

Dr. A. J. Brink, van Pretoria, is aangestel as Professor van Interne Geneeskunde. In 1946 het hy sy M.B., Ch.B. graad aan die Universiteit van die Witwatersrand behaal; in 1951 sy M.D. graad aan die Universiteit van Pretoria, en in 1951 die M.R.C.P. graad te Londen.

Dr. A. J. Brink

Dr. Brink het die volgende poste beklee: Huisdokter gedurende 1947 aan die Algemene Hospitaal in Pretoria; Lektor in Interne Geneeskunde aan die Witwatersrandse Universiteit; Kliniese Assistent in Interne Geneeskunde, Universiteit van Pretoria; Registrateur aan die Hammersmith Post Graduate Medical School, Londen; Fellow in Paediatrics, Johns Hopkins Hospital, Baltimore, V.S.A.; Senior voltydse en later deeltydse Internis aan die Universiteit van Pretoria. Ook is hy konsulterende internis vir die Militêre Hospitaal en die Munisipale Bystandsfonds in Pretoria.

Dr. Brink het verskeie beurse en pryse verower, o.a. 'n prys vir Geregtelike Geneeskunde, die David Lurie Memorial-prys in Chirurgie, die Harwood Nash-prys vir Kliniese Chirurgie, die 1951

Cecil John Adams Memorial Travelling Fellowship. 'n Reisende Toekenning van W.N.N.R., en die 1952 Johns Hopkins Fellowship. Dr. Brink was behulpsaam met die opbou van die Hartnavorsingseenheid van die Universiteit van Pretoria. Hy is 'n lid van die kardio-pulmonale komitee van die W.N.N.R. en is tans besig met studies op hierdie gebied.

Die meeste van dr. Brink se 14 verhandelinge het in hierdie *Tydskrif* en die *Suid-Afrikaanse Geneeskundige Tydskrif vir Laboratorium- en Kliniekwerk* verskyn.

Dr. Brink is 32 jaar oud, en hy is getroud.

SOUTH AFRICAN MEDICAL AND DENTAL COUNCIL : ETHICAL RULES

The Minister of Health in the exercise of powers conferred upon him by the Medical, Dental and Pharmacy Act of 1928 has (in Government Notice No. 2493 of 23 December 1955) approved the amendment of the rules regarding conduct of which the Council may take cognizance, made by the South African Medical and Dental Council under sub-section 2 of section 94 of the Act.

Rule 1 Para 5 is now to read as follows: 'The printing on envelopes of any information other than the practitioner's name without his title or any qualification and a return address in case of non-delivery'.

Rule 13 is amended to substitute for the existing list of designations of specialists one which inserts the word 'specialist' in every designation; e.g. specialist surgeon (as hitherto), specialist anaesthetist, specialist orthopaedist, etc.

In Rule 19 the following caption is substituted for the present caption: '19. Professional appointments other than (i) appointments made under the Public Service Act, (ii) appointments made under the Hospital Ordinances of the various Provinces, (iii) appointments of medical practitioners and dentists to academic or research posts at Universities and research institutions and similar institutions'. The amendment takes the place of existing provisos, now deleted, to rule 19 (1) and rule 19 (4).

The caption of Rule 19 (bis) is changed to read, 'Professional appointments made under the Hospital Ordinances of the various Provinces and to Universities and research institutions'. Rule 19 (bis) paragraph 1 is changed to read 'Acceptance by a medical practitioner or a dentist of any professional appointment under the Hospital Ordinances of the various Provinces, or any professional appointment to a University or Research Institution unless (*a*) a notice inviting applications for such appointment shall have been advertised in the official Journal of the Medical or Dental Association of South Africa (as the case may be); (*b*) details of the proposed appointment are made available to bona fide enquirers, and to the Council on request; (*c*) the contract is in writing and sets out clearly the clinical or professional services which the medical practitioner or dentist agrees to render and the fees or remuneration which shall be payable to him by the party appointing him for such services'.

A note is added to Rule 19 which reads: 'Note: Transfers or promotions in the normal course within a service will not be regarded as new appointments and such posts need not be re-advertised'.

PRACTICE IN NATIVE TOWNSHIPS*

E. W. TURTON, M.B., CH.B.

Boksburg

I was requested by Dr. Struthers to interview officials of the Government Department for Native Affairs in regard to applications of Indian Doctors for permission to practice in Native Townships, and related matters.

I was sympathetically received by a Mr. Gray on behalf of his department. He was fully conversant with the correspondence which I had at my disposal (re A. B. Kaze and Z. F. Asvat). He quoted from the following letter:

Letter from Secretary for Native Affairs to Convener of Parliamentary Committee, dated 25 March 1953

MEDICAL PRACTICE IN URBAN NATIVE LOCATIONS—BENONI

'In accordance with the undertaking given at the meeting in December 1952, between representatives of your Association and the Secretaries of Health and Native Affairs, I have the honour to append the decisions reached thereafter by the two Departments, together with explanatory comments pertinent to these decisions:

1. It is necessary and the aim of both Departments to have a 24-hour daily Municipal health service in all the large locations;

2. where such a service is provided to the satisfaction of the Departments of Health and Native Affairs, the question of allowing non-Native practitioners to have consulting rooms within the location concerned does not arise;

3. where a 24-hour Municipal service does not exist, the question of allowing a non-Native practitioner to establish consulting rooms in a location will be considered in relation to the medical requirements of residents of the location concerned.

'In this connection, it should be noted that, in terms of the Native (Urban Areas) Consolidation Act No. 25 of 1945, it is in the discretion of the local authority to decide whether it will allow a non-Native to obtain an interest in land within a location (e.g. to lease consulting rooms). If such a decision is favourable, the matter is still subject to the approval of the Minister of Native Affairs. The principle involved is designedly the protection of the interests of the Natives and the activities in respect of which any such interest can be obtained are limited to those covered by section 42 (*f*) of the Act.

4. The question of accessibility of practitioners practising in locations, should be given careful attention by local authorities and the position could, where practicable, be improved by—

(i) providing public telephones at strategic points, whence emergency calls could be transmitted to the practitioners concerned;
(ii) establishing consulting rooms for Native practitioners inside locations; and
(iii) providing (as an interim measure) Municipally owned consulting rooms inside the very large locations (e.g.) in the Orlando-Jabavu area) for lease to non-Native practitioners, these rooms to be placed solely at the disposal of Native practitioners in due course.

'Attention is drawn to the fact that any European practitioner and, subject to the requirements of any other law, any other non-Native practitioner is perfectly at liberty to establish his consulting rooms in close proximity to the location and in this way to provide in the great majority of cases that degree of accessibility envisaged in the annexure to your letter of 30 December 1952. In this connection, *it should be noted that the majority of location regulations make provision for free access to locations by medical practitioners. In other words no special permission is required for their entry into locations*' (italics not in original letter).

I raised the difficulties which may arise when the Group Areas Act is introduced fully; mainly that the Indian area may be placed

*Published by resolution of Federal Council of Medical Association of South Africa.

so far away from Native locations as to make it inaccessible to Indian medical practitioners. Mr. Gray stated that it was possible that this would happen and the Act did not make provision for any variances.

I recommend that if possible a small committee be appointed to investigate ways and means to accommodate all practitioners and so enable them to practice amongst non-Europeans within the framework of the Group Areas Act, and apply for minimal concessions which may assist the practitioners to continue giving a service to the locations. I suggest this committee be empowered to co-opt medical practitioners closely associated with this type of practice.

October 1955.

ASSOCIATION NEWS : VERENIGINGSNUUS

CONTRACT PRACTICE WITH PARTICULAR REFERENCE TO CONDITIONS EXISTING IN THE TRANSVAAL

REPORT SUBMITTED BY THE SUB-COMMITTEE OF FEDERAL COUNCIL APPOINTED TO REPORT ON THE ECONOMICS OF MEDICAL PRACTICE

PREFACE

1. *Scope of Report*

At the commencement of this Committee's work, it was found that the records available were of little or no assistance. As a result, the analysis contained in the Report deals primarily with the situation in the Transvaal, but the Committee is of the opinion that the conclusions drawn from the analysis must apply to the whole of the Union of South Africa. The Report is therefore confined to terms of reference (1) and (2), viz. (1) To investigate the pattern of medical practice in South Africa, and to make an analysis thereof, and (2) If the existing pattern is found to be unsatisfactory, to make recommendations on future policy.

2. *Committee's Recommendations*

Your Committee submits the undermentioned recommendations to Federal Council:

(*a*) That the Ten Principles given hereunder, similar to those adopted by the American Medical Association in 1934, should be adopted by the Medical Association of South Africa:

(i) All features of medical service in any method of medical practice should be under the control of the medical profession. No other body or individual is legally or educationally equipped to exercise such control.

(ii) No third party must be permitted to come between the patient and his medical practitioner in any medical relation. All responsibility for the character of medical service must be borne by the profession.

(iii) Patients must have absolute freedom to choose a legally qualified medical practitioner who will serve them from among all those qualified to practise and who are willing to give service.

(iv) The method of giving the service must retain a permanent, confidential relationship between the patient and a 'family doctor'. This relationship must be the fundamental and dominating feature of any system.

(v) All medical phases of all institutions involved in the medical service should be under professional control, it being understood that hospital service and medical service should be considered separately. These institutions are but expansions of the equipment of the doctor. He is the only one whom the laws of all nations recognize as competent to use them in the delivery of service. The medical profession alone can determine the adequacy and character of such institutions. Their value depends on their operation according to medical standards.

(vi) In whatever way the cost of medical service may be distributed, it should be paid for by the patient in accordance with his income status, and in a manner that is mutually satisfactory.

(vii) No plans for the provision of medical services must have any connection with cash benefit payments for death, funeral or sick-pay, or any other benefits which do not directly concern the treatment of the patient.

(viii) Any form of medical service should include within its scope all registered medical practitioners of the locality covered by its operations who wish to give service under the conditions established.

(ix) Systems for the relief of low income classes should be limited strictly to those below the 'comfort level' standard of incomes.

(x) There should be no restrictions on treatment or prescribing, unless such restrictions have been formulated and enforced by the organized medical profession.

(*b*) That it should be the policy of the Association to sponsor local pre-payment plans for medical services on the basis adumbrated in the Ten Principles in substitution of medical aid and benefit societies as presently constituted.

(*c*) That it is considered essential that first-hand knowledge of the administration of such pre-payment plans be obtained forthwith in Canada and the United States of America and, for this purpose, the Public Relations Officer be commissioned to visit these countries to investigate the systems in use there and to prepare a detailed report on administration, scope of benefits, etc., which would be appropriate in the establishment of such a scheme in South Africa.

(*d*) That an early commencement be made with the establishment of such a plan in some highly populated and industrialized area such as Johannesburg in order that it could serve as a pilot scheme for the Union of South Africa.

(*e*) That no new medical aid or benefit society be recognized excepting in exceptional circumstances and then only on a temporary basis.

3. The Sub-Committee's recommendations given above and its Report were unanimously adopted for submission to the Federal Council by the undermentioned members, who were present and voting, at a meeting held on 15 August 1955: Dr. M. Shapiro (Convener), Dr. A. L. Agranat, Mr. G. T. du Toit (Co-opted Member), Mr. J. G. du Toit, Dr. J. G. Osche, Dr. M. Peskin, Mr. J. Wolfowitz and Dr. F. Ziady. In attendance, Mr. O. W. Johns Public Relations Officer).

4. *Summary of Report*

Paragraphs

1—6 Introduction and reasons for the establishment of medical aid and benefit societies.
7—12 Medical Aid Societies—present method of granting approval and criticism of a centralized control.
13—21 Criticism of the conditions to which medical aid societies must conform to obtain approval, together with suggestions for the enforcement of the conditions in order that the profession may be protected.
22—26 Criticism of the conditions to which benefit societies must conform before receiving recognition.
27—41 Comment on the benefit society system.
42—53 A comparison of the fees charged by the profession and those made by persons or institutions providing ancillary service, and the increases which have taken place during the past 10 years.
54—61 General comment on the present position.
62 Suggestion that the profession should sponsor its own medical care insurance plan.
63—66 Concluding remarks.
Annexure A. Existing Rules of the Medical Association of South Africa to which Medical Aid Societies should conform before receiving approval by the Medical Association.

Annexure B. Existing Rules to which Sick Benefit Societies should conform before receiving approval by the Medical Association of South Africa.

Annexure C. Medical Care Insurance sponsored by the Profession in Canada.

(i) Letter written by Dr. S. S. B. Gilder, Co-Editor of the Canadian Medical Association Journal.
(ii) Letter written by Dr. A. D. Kelly, General Secretary of the Canadian Medical Association.
(iii) Report on Trans-Canada Medical Plans extracted from the Canadian Medical Journal.

Annexure D. The History of Medical Care Insurance in the USA.

THE REPORT

1. The Committee appointed by Federal Council to investigate the Economics of Medical Practice has pleasure in presenting this report on Contract Practice with particular reference to the Conditions existing in the Transvaal.

2. The Profession has always attempted to the best of its ability to assist the lower-paid sections of the community to meet the costs of medical treatment. This principle was recognized when the profession allowed the formation of benefit and medical aid societies prior to the commencement of World War II. Since the cessation of hostilities, the profession has continued to recognize these societies subject to the fulfilment of certain conditions, but the growth both in number and size of these societies has caused the profession to become perturbed.

3. The pre-war cost of medical and surgical treatment was comparatively low but, even at that time, many families in the lower-income groups found themselves faced with crippling financial burdens when the costs of serious illness had to be met. The continued rise in the cost of living has created a demand for insurance against the cost of serious illness not only among the lower-paid income groups, but also among the highly paid. This is the change in pattern which has caused the profession to become concerned as the low rates granted to the benefit, and medical aid societies were meant to cater for the poorly paid only.

4. It must now be faced that, with a background of unpredictable risks, high cost of modern treatment, and high cost of living and taxation, the public demand for protection through insurance must be granted. This movement has come to stay and will continue to grow until maximum development has been reached.

5. The State has already assumed responsibility for medical treatment of the indigent by providing medical services through district surgeons and the out-patient departments of public hospitals.

6. In order to examine the pattern which has emerged in recent years, it is necessary to consider separately medical aid societies and benefit societies. The rules to which these societies must conform before receiving approval are an important part of the picture; consequently, the rules appliacble to medical aid societies are given in Annexure A and those for benefit societies in Annexure B.

MEDICAL AID SOCIETIES

7. The policy of the Association has been to encourage medical aid societies in preference to benefit societies. Generous concessions were made to these societies in the matter of fees by granting a tariff which is generally considered to be about one-third lower than private fees. The favourable terms granted in the tariff were for persons falling into a low-income group, and it was understood that the fees would be guaranteed by the societies. However, a number of unsatisfactory features have insinuated themselves, and these will be dealt with in the following paragraphs.

8. Federal Council has retained the right to accept or reject applications made by medical aid societies for approval. If the society is approved, then it may have its members treated by the profession at the agreed tariff of fees. Branches are from time to time consulted in the matter of medical aid societies applying for recognition, but the organization handling this matter on behalf of Federal Council is not bound to consult the Branch. On the other hand, Federal Council has delegated the power to Branches to deal with all matters relative to the recognition of benefit societies provided they fall within the regulations laid down.

9. The distinction made between benefit societies and medical aid societies in this instance appears to be arbitrary and largely illogical. Fundamentally, there is little or no difference between each type of society, as the main object of each is to provide medical care insurance for members. The fact that one society pays a separate fee for each service and the other pays by way of a salary or capitation fee makes very little difference to the principle involved.

10. Medical aid societies are stated to be national in character while benefit societies are considered to be confined to certain set localities. This statement is untrue, as the majority of each type of society operates in strictly defined limits. Members of medical aid societies proceed on holiday or business trips, but it is submitted that the cost of medical fees incurred on these trips must be very small and that the vast bulk of the expenditure is incurred in the area in which the societies members reside. There are, of course, medical aid societies with members in all the provinces of the Union, but there are also benefit societies which operate in all the provinces, for example, the S.A.R. & H. Sick Fund, the Leather Industry Sick Fund and the Motor Industry Sick Benefit Fund.

11. A body dealing with these matters and operating from a place far removed from the one in which the society exists must of necessity be working under a handicap. No matter where the control is situated, provided it is not a local one, the same criticism must apply. A local body must have the advantage, as it knows the persons and conditions involved. If the necessity arises, it can take speedy action and not rely on correspondence alone as a means of communication.

12. Local conditions vary exceedingly in most Branches, and terms which would be generous in one may quite well be inadequate in another. Therefore, it is conceivable that one Branch may approve a medical aid society while another may offer strenuous opposition. It follows then that any argument advanced in favour of Branches dealing with benefit societies' applications for recognition must apply with equal force to medical aid societies. It is, therefore, submitted that in all cases of application for approval made by medical aid and benefit societies the decision must be made to the appropriate Branch. Medical aid societies operating in areas which fall under the jurisdiction of more than one Branch, should be required to seek recognition from each Branch.

13. The general rules and conditions governing the recognition of both types of society are laid down by Federal Council. This was intended to ensure a measure of uniformity in the conditions which govern recognition.

14. Rule 2 was obviously framed with the intention of preventing highly paid persons from belonging to a medical aid society and limiting membership to the lower-income groups. Has this Rule achieved the purpose for which it was framed? The reason for asking this question is as follows:

No machinery was provided for checking, at regular intervals, the incomes of members accepted by the medical aid societies. Assurances were certainly given by the societies but in the course of time, rules and assurances are often overlooked or forgotten. The Association granted the medical aid societies very favourable terms in the nature of a tariff of low fees, and the societies stand to gain at the expense of the profession. In return for these concessions, it would seem logical that the profession should ask for the institution of a system to ensure that the benefits are going only to the income groups for which they were intended.

15. To control this situation, it is suggested that:

(i) the Association must insist that the Society obtains from the auditors of each constituent group certificates showing the number of employees, their dependants and the income groups into which they fall;
(ii) the society should make application annually for recognition, and the application should be supported by the auditor's certificates mentioned above, together with a certificate from the society's auditor certifying the membership figures of the society;
(iii) there is much to be said in favour of annual applications for recognition, as this system would lend itself to the control of societies which are developing on lines which are not acceptable to the profession.

16. It was a mistake to employ the word 'salary' in Rule 2. In many organizations to-day, this word has lost its pre-war significance. Many devices are now employed to grant the employees more pay without increasing the basic salary; this is done in the hope that one day labour may again become plentiful when it will be much easier to drop a special allowance than reduce a basic salary.

17. Many executives in large firms are given basic salaries and

in addition thereto are granted large entertainment, travelling and motor-car allowances, although very little entertaining or travelling is done. In many cases, the allowances exceed the basic salary. The word 'salary' does not include bonuses or other sources of income. A person who accepts benefits from any scheme which is being subsidized by the profession should be made to produce independent verification that he is a person who is within the income group qualifying for benefits, as many salary and wage earners have independent sources of income.

18. Income from salaries is liable for both normal and super tax. Owing to the manner in which the Income Tax Act is framed, it is unprofitable for the owner of a company to draw salary in excess of £1,800 per annum. The balance of his income from the company is drawn by way of dividends which are subject to super tax only. Generally, the income so derived is far in excess of the amount drawn as a salary.

19. In view of these explanations, it is again submitted that Rule 2 does not safeguard the profession, nor can it be assumed that those who were meant to benefit are in fact receiving the benefits which flow from the concessions made by the profession. For example, the National Medical Aid Society has admitted that the higher income members incur an inordinately high proportion of the expenses to be met by the society. Steps are being taken by the society itself to rectify this situation.

20. The first sentence in Rule 4 states that the limitations placed on medical benefits should be minimal. This direction appears to be ignored by some societies to the detriment of the members of the society and the profession. It would appear that, as the medical aid societies are obtaining favourable terms, they should adopt a constitution which standardizes the benefits given. It must naturally follow that a society which limits various benefits does not fulfil the purpose for which it was formed, and it must inevitably lead to exploitation of the profession. If the Association insisted upon a certain standard of benefits before granting approval, it would:

(i) control societies which do not in fact give a particular benefit, but merely use the Association's approval to obtain the reduced tariff of fees;

(ii) prevent members of the profession from charging lower fees to medical aid society members when the society is not responsible for the fees. This applies particularly to maternity cases and eye tests. Rule 9 was framed to prevent this from happening, but the weakness in the system is that patients seldom produce their cards. A busy practitioner will invariably accept the patient's word that he is entitled to a benefit, and may or may not discover the particular benefit is limited or excluded after the rendition of the account at the lower fee;

(iii) control those societies which are at present advertising and extending membership to all and sundry, thus curtailing private practice. Particular attention should be given to those societies which are adopting a policy of extending their activities by accepting all comers. This policy is a dangerous one to the profession, not only because of possible wholesale exploitation, but also because this particular type of society may grow so large that it will be able to dictate policy to the profession.

21. Paragraph 8 in the General Preamble of the Tariff of Fees contains the following sentence: 'Accounts which are older than 6 months will not be acknowledged as claims and will not be paid.' It is realized that it is to everyone's advantage to have claims settled as expeditiously as possible, but why penalize the profession? The Prescription Act lays down a period of 3 years for this type of claim, but that period may be shortened by special agreement as in this case. The benefit societies stand to gain, but not the profession. Circumstances, such as serious illness, may prevent the lodgement of a claim within 6 months or a charge may be omitted in error and only be discovered when the annual audit is being performed. Is it just that the practitioner should forego his fees in cases such as these?

BENEFIT SOCIETIES

22. The following is the comment on the rules to which benefit societies should conform, and the Rules referred to are set out in Annexure B.

23. Rule 1 defines the salary limites of members of benefit societies. In principle, this rule is sound as only persons falling into the lower-income groups should be allowed to participate in benefit society schemes, which are, by virtue of the low fees charged, subsidized by the profession. The type of person falling into the groups specified as a general rule prefers to select his own medical attendant instead of submitting to treatment in a public hospital. This tendency should be encouraged, as it fosters independence.

24. The Rule was passed by Federal Council, but again it appears that there is no machinery in existence to guarantee that it will be observed by the benefit societies. Take the example of the Mines Benefit Society, which would not qualify for recognition in terms of this Rule. It has as members many persons whose incomes are in excess of the limit of £1,500. Furthermore, the subscriptions paid by a mine manager earning about £4,000 a year are the same as those of a labourer earning £400 a year. Nor does that society pay its panel doctors a higher capitation fee for the highly paid employees. The Association's rules have not been enforced in this case.

25. Specialist appointments to benefit-society panels have been the cause of much dissatisfaction in the profession. The appointments are not numerous and cover a large section of the population. When the posts are advertised, applications are received from senior and junior men. Naturally the society will select one of the senior men. This means the junior men seldom, if ever, receive one of these appointments. This is a factor which is dangerous to the well-being of the Association as the juniors are likely to regard the whole business as one run for the benefit of the senior men.

26. Recent legislation by Federal Council has attempted to meet this situation by ruling that in a speciality there shall be one specialist employed for every 10,000 members. This figure may be adequate for say orthopaedic surgery, but is it not too high for general surgery and general medicine? For other specialities such as thoracic surgery and neuro-surgery, it would appear to be far too low. In the circular, it is not stated whether the figure of 10,000 members is exclusive or inclusive of dependants. This is a matter of importance, as some societies make no provision for the dependants of members.

27. The capitation rates appear to be too low. It is necessary as a basis of comparison to again mention the Mines Benefit Society. Before 1940, the date when the individual mine societies amalgamated, panel fees varying from 3s. 0d. to 4s. 6d. a member a month were paid. However, various benefits were excluded—in particular gynaecology. When amalgamation took place *all* benefits were included, and there was considerable negotiation on the subject of a panel fee. This was eventually fixed at 4s. 6d., which was assumed to be a fair fee. Towards the end of 1940, it was increased by 10d. a month to include anaesthetic and assistants fees. This consolidated fee was only in recent years increased by stages to 6s. 8d. a member a month. In the interim, the cost of running a practice had more or less trebled and the general cost of living had doubled. It is obvious, therefore, that the 25% increase granted by the Mines Benefit Society does not come anywhere near meeting the rise in the cost of living or the cost of running a practice.

28. From time to time during negotiations between the Mines Benefit Society and the Mines Benefit Societies Medical Officers Group, the society threatened to institute a full-time, salaried service. The threat is an empty one for two reasons. Firstly, the members of that society would not favour that system. At Carletonville the society has full-time, salaried medical officers and there is considerable agitation for an open panel. Secondly, when one of the posts at Carletonville became vacant last year and the Medical Association disapproved of the post advertised, only three applications were eventually submitted. These applicants were found to be unsuitable. Considerable negotiation then took place with the Association and only then, after re-advertising, was it possible to obtain the services of a suitable man from among a small number of applicants.

29. The inadequate rate of remuneration offered by the benefit societies is undoubtedly to blame for many of the undesirable practices which have sprung up during recent years. The medical men are inclined to accept more work than they can properly do, and they therefore employ assistants, thus causing an imbalance of available work.

30. Benefit and medical aid societies continue to flourish and multiply because they are fulfilling a popular demand. The Association has recognised the principle of insurance for medical care, and has introduced measures in an attempt to regulate the activities of the societies. These measures do not appear to have been particularly effective for the reasons stated above. It is essential to enforce rules and see that they are carried out correctly, if they are to be effective. Furthermore, they must be enforced in each

and every case. The smaller societies are firmly of the opinion that the Association works its will on them because they are small but is afraid to force a society like the Mines Benefit Society to observe the rules. It is for this very reason that the smaller societies have for some time discussed amalgamation.

31. The prevailing opinion among those who manage societies is that the profession is overpaid for its services and any request for an increased fee is regarded as avarice. These men regard all fees paid as being net profit, and are inclined to overlook any argument regarding the increased costs of running a practice, and that the doctor is entitled to expect remuneration commensurate with his knowledge and responsibilities, the hours at which he is expected to be available, and the standard of living which he and his family may reasonably expect as a reward for his labours.

32. A careful study has been made by lay bodies of the working of the Medical Association of South Africa. It was made with the express purpose of discovering the weak points in the organization. It was found that like many democratic organizations, it moved very slowly and that matters were referred from one committee to another. Consequently, a policy was adopted of not precipitating any violent action, but of adopting delaying tactics in dealing with the Association. It was realized that the honorary secretaries were busy men, and that only spare time could be devoted to committee work. These delaying tactics succeeded on many occasions as valuable time was gained, and in some cases the issues were sidetracked and forgotten.

33. The profession appears to have been unduly influenced in fixing fees by the propaganda put out by the societies. During the past 15 years, there has been a constant cry from the societies whenever increased fees are mentioned, 'The members can't afford it'. The cry appears to have been very effective, because it appears in the Federal Council minutes. On considering the circumstances, it would appear that the Profession should now ask itself, '*Can we afford it?*'

34. The profession should be acclaimed by the public for the sacrifices it has made in the matter of fees. The figures for the largest benefit society in the Transvaal have already been given; an increase in the panel fee of 25%. In spite of this extremely generous treatment, the public now revile the profession on every possible occasion. This attitude is directly attributable to the persons who have benefited most—the members of the societies.

35. This is how the situation has arisen. Through the panel doctors, the benefit societies provide unlimited medical services and may provide 'free' medicines without any direct payment for the service or the medicine. In theory, this system would appear to be ideal but, in practice, it is not only detrimental to the profession, but also to the members. Many of the members regard the panel doctors as servants who should be at their beck and call every hour of the day or night. When medicines are provided, they clutter up consulting rooms and wait for some time merely to obtain a prescription for 6d. worth of aspirins.

36. It has been stated that a practitioner with a panel of say 700 members has to see in his consulting room approximately 60 to 80 patients a day and, in addition, he has to make calls at panel members' houses. When a panel doctor surveys the patients in his consulting room he knows that the majority are seeking certificates, or they plead imaginary ailments in order to obtain household remedies. He cannot afford the time to make examinations, which in most cases are not expected by the patients; so he may adopt the habit of prescribing without making an examination. It is certain that very few of these patients would attend if they had to pay for an examination. Among the waiting patients, you will find a small number who require treatment. They are in a number of cases difficult to diagnose without proper examination. After these people have attended a number of sessions they become discouraged, and consult a specialist. Here the story is altogether different, because time is allotted for the examination. That, together with other aids such as radiology and laboratory services, enables the specialist to diagnose and treat the case. The patient is then loud in his denunciation of the panel doctor as an incompetent practitioner. These people never attempt to analyse the situation; in fact, when it is pointed out to them that the panel doctor and the patient are victims of a pernicious system, they are incredulous.

37. In accepting the principle of benefit-society appointments, the profession has placed itself in a unique position—one which does not exist in any other profession or trade. A doctor accepting a benefit-society appointment is subject to the rules of the society which provide that his services are available whenever required—either day or night—and the members are prone to exercise their rights under the rules. This situation inevitably leads to a deterioration in the respectful and considerate relationship between patient and doctor. Where, in addition, the patient has no choice or a restricted choice of doctor, he must become critical and even resentful of the service supplied.

38. Where membership of a benefit society is a condition of service, the patient forfeits the right to be treated by any medical practitioner other than a panel doctor appointed by the society. Every general practitioner has, no doubt, had the experience of losing patients whom he has been treating off and on for years merely because the patient has changed his employment.

39. The panel system is largely to blame for the deterioration in the status of the doctor which has occurred on the Witwatersrand. The practitioner has, if he wishes to earn a living, to hurry through his work in order to complete his calls and consulting-room sessions. The public has been stated to have become 'specialist minded'. Surely this is not surprising in the circumstances.

40. The panel doctor has, under the present system, assumed the role of an insurance company and, in principle, this is wrong, as no individual doctor should be expected to carry this risk.

41. Initially, the acceptance of lower fees by the profession amounts to a subsidy granted to the lower-income groups in order that they may protect themselves, at a reasonable rate of subscription, against the crippling costs of serious illness. These societies, especially the larger ones, do provide adequate cover for their members, but unfortunately, a number of abuses have crept in which are harmful to the members and to the profession. The complaint is against an unlimited 'free' general-practitioner service and the provision of 'free' medicines. Many members of these societies have resorted to calling in a panel doctor for very trivial reasons, or wasting his consulting hours, merely to obtain a simple medicine. These practices are a negation of the principle on which benefit societies were founded. It is submitted that the fees incurred in minor illnesses have never caused any family hardship and, therefore, if benefit society members had to pay for the first 3 visits in each illness, this would do much to check current abuses. The payment of a subscription, either weekly or monthly, is no deterrent, as it is deducted from the wage or salary at source and, after a short time, it is not missed. It is usually found that appreciation is shown only when direct payment is made for a service.

FEES

42. Some comment has already been made on the fees received by the profession, but now let us compare the increases granted to the profession as compared with those granted to institutions and professions supplying the ancillary services and treatment for the sick.

43. *Hospitals and Nursing Homes.* In 1940 (prices were stable then and had not yet felt the effect of the war or inflation) open ward accommodation in Johannesburg nursing homes was charged to approved societies at 11s. 3d. a day, and has risen steadily to the present figure of 37s. 6d. a day—an increase of 233%. During the same period, the rate for private patients has risen from 12s. 6d. to 42s. 6d. a day. The lower rates were granted to approved societies in order to encourage them to grant hospital benefits. This helped the hospitals to maintain a good occupation rate, and so meet the fixed overhead charges. The profit was made from theatre fees and private patients.

44. The number of beds occupied by contract practice patients in 1940 was of the order of 15% to 20% of all nursing-home beds in Johannesburg area. The Chairman of the Johannesburg Nursing Homes Association recently stated that contract-practice patients were now occupying 80% of the available beds. A further increase is expected. It is evident that the nursing homes must soon cease to grant the societies lower rates.

45. *Pharmacists.* Of all the persons connected with the treatment of the sick in nursing homes, the pharmacist is in the most favourable position financially. In 1940 nearly all his work consisted of dispensing medicines and supplying dressings. There were comparatively few ethical preparations. To-day, his work on nursing home cases is divided as follows: 5% dispensed medicine, 10% dressings and 85% ethical preparations.

46. There have been substantial increases in the dispensing tariff, and in the prices of dressings. Ethical preparations are supplied to chemists by wholesalers or manufacturers at fixed prices, and they are allowed a profit mark up of 50%. It is obvious that with higher prices the profits increase accordingly. The

Pharmaceutical Society has established a checking organization which handles all the benefit and medical aid societies' accounts. The discount granted does not in most cases exceed 10%.

47. *Physiotherapists.* In 1940, physiotherapists were paid 7s. 6d. for a full treatment. After negotiation with the societies in 1948, the fee was increased to 12s. 6d.—an increase of 66⅔%. As from 1 August 1955 the proposed fee will be 15s. or an increase of 100% on the 1940 figure. The physiotherapists receive a travelling allowance of 1s. 3d. a mile.

48. *Benefit Society Subscriptions.* As the Mines Benefit Society was quoted earlier in this memorandum, the subscription figures of that society must now be quoted. The full married rate of subscription in 1940 was 19s. 6d. a month. It had to be adjusted early in the society's life for various reasons. It is now 42s. 1d. a month—an increase of 115·8% as compared with 1940. This increase has been caused mainly by the increased cost of medicine (£6,000 to £15,000 a month) and hospital fees. Benefits were also increased, the main items being sick pay (by 50%) and the death benefit, which was increased from £100 to £350. Increased fees to the medical officers accounted for only a very small proportion of the higher subscription.

49. *The Medical Profession.* The minutes of the Southern Transvaal Branch Council of 14 October 1938 lay down the consulting fees to be charged to members of a society. They are as follows: 10s. 6d. up to 6 p.m., 15s. 9d. up to 9 p.m., and 21s. from 9 p.m. to 6 a.m. This tariff obviously makes provision for higher fees for after-hour calls—a principle which should be applied rigorously by the profession if the practitioner is to have any leisure time or sleep.

50. The fees quoted in the latest tariff of fees are as follows: Consultation (rooms) 12s. 6d., visits to residence, nursing home or hospital 15s., and visits between 7 p.m. and 7 a.m. £1 1s. (The municipal area of Johannesburg covers 93·66 square miles, and it is nearly all built up. Travelling is difficult and the fee of 15s. is not adequate if any distance is to be covered.) Since 1938, there has been a World War which has caused a rise in the cost of living of over 100%; and a rise in the cost of instruments and motor cars of something like 250%. To compensate the profession for these increases, consulting room fees have increased by 19%, and fees for visits after hours have not increased.

51. In order to carry the comparison one stage further, let us see how a doctor fares when his fees are set out side by side with the charges made by an electrician. Johannesburg doctors' charges for house visits are different from those which may be made elsewhere in the Union according to the tariff of fees for medical aid societies, and the examples quoted are based on that tariff for general practitioners. The electrician charges 17s. 6d. an hour for his time, and it is calculated to the next half-hour. His minimum charge is 17s. 6d. plus travelling expenses at the rate of 1s. a mile both ways. The following factors are equal in all three cases: (1) Mileage—6 miles each way; (2) travelling time—25 minutes each way (this is reasonable time in built up areas where traffic is heavy); (3) time with patient or spent on job—30 minutes.

Accounts rendered:

	Electrician (J'burg area)	*Doctor (J'burg area)*	*Doctor (elsewhere)*
Time	£1 6 3	£– 15 0	£– 12 6
Travelling	12 0	nil	10 0
	£1 18 3	£ 15 0	£1 2 6

52. It appears from the foregoing that the impact of increased costs has had the tendency to keep medical fees down while the fees and charges made by others have kept pace with current costs. If the whole situation was not so serious, it would be amusing. No doubt the societies do find the situation amusing, as they are now obtaining practitioners' services at what would appear to be something less than pre-war rates. The increase of 19% referred to above, disappears completely when the increased rates in income and super tax are taken into consideration. To sum up, it appears that the profession is subsidizing the benefit and medical aid societies in order that they may give their members increased benefits and meet the legitimate claims of the persons supplying the ancillary services.

53. The fees and charges made by other professions and institutions have kept pace with the increase in the cost of living. The profession has not taken this precaution. A small increase from time to time proportionate to the rise in the cost of living would not have met with violent opposition as it would have been reasonable. To illustrate this point, reference must be made to a proposed increase of 45% in fees about 2 years ago. At this time cabinet ministers and others were predicting that the rise in costs had been halted and the public was looking forward to lower living costs when the news of the projected increase in general practitioners fees was published. Public reaction was immediate and violent. Numerous letters appeared in the daily press criticising the profession and questions were asked in parliament.

GENERAL COMMENT

54. The foregoing has been a criticism of the position as it is to-day, and the rectification of the faults as they now exist would appear to be an insoluble problem. Drastic action could be taken by the Association, but this would precipitate a war with the benefit and medical aid societies. No doubt the Association could win the war, but the resultant publicity would be most undesirable, as public opinion would favour the societies.

55. The benefit and medical aid society movement may from the Association's point of view be likened to a cancerous growth. If the main trouble is dealt with, there will always be secondary troubles requiring attention. Strict control will cause bitter resentment and must lead to a constant state of warfare. The officials of these funds openly boast that they hold the purse-strings, and they are in control of the situation. They are antagonistic towards the profession. Even if control measures were instituted, would it be an answer to the problem?

56. One must consider the fundamental issues involved in this problem. There is sufficient evidence to support the assumption that the societies will continue to grow both in number and in size until 90% or more of the fee-paying population is involved. When this stage is reached—and it will not be very long at the present rate of growth—numerous members of the profession will have to find their entire livelihood from these sources, and unless some economic adjustment is made, they will be reduced to penury. Furthermore, it must follow that the practitioner will become the part-time employee of numerous societies, who will dictate policy to him, and he will have to observe the rules of each society. Being a part-time employee, he will not receive the benefits of full-time employment such as a pension and paid holidays.

57. It will be seen in all disputes between employers and employees that it is invariably the employer who gains control of the situation. The employees can strike or employ other devices to make things awkward for the employers but, in the end, the employer invariably wins because he controls the capital. Sometimes the employee receives a portion of his demands, and sometimes he receives nothing at all. These statements represent a true picture of what has happened to the negotiations of the medical officers of the Mines Benefit Society since its inception. The profession has suffered the same fate in some of its negotiations with other societies.

58. When the present benefit and medical aid society movement is fully developed, it will reach its full strength through the association of these societies. It is quite possible that they will then undertake disciplinary measures against practitioners. Perhaps a lay body may try and convict a practitioner on professional grounds and apply sanctions. He would then be faced with financial ruin as he would not be employed by the societies.

59. Governments have always shown a tendency to interfere in a situation which is unsatisfactory and involves a major portion of the population. There is no doubt that there will be an unsatisfactory state of affairs if hundreds of different societies are all providing different benefits and following different policies. Workmen's Compensation Insurance was taken over by the State because it was considered necessary to standardize policy and benefits. This could well happen in the present situation after it has been developed to its full extent.

60. The Profession would be in a particularly weak position to negotiate under present circumstances. The general practitioner is being paid at sub-economic rates, and the specialist holding a part-time salaried appointment is in the same position. These rates would be known to the Government, and it would sound most unconvincing to say: 'We were prepared to work for private societies at that rate, but not for the State'. The reactions of a senior civil servant who has taken 20 or 30 years to reach £1,800 a year can well be imagined when he is told by a specialist that a part-time salary of £2,000 a year is inadequate. The further weakness in the Association's case would be those practitioners

who are earning so little under the present system that they would welcome a steady, salaried post.

61. All the evidence points to the fact that the present situation is a dangerous one for the profession, and it cannot be allowed to continue. However, the fact remains that the public must have insurance. It would appear that the only question to be answered is: Who is to provide the public with insurance? We have dealt at some length with some of the abuses which exist under the present regime. A State Service would be quite unacceptable to the majority of the public. The evidence in support of the latter statement is that even the lower-paid groups prefer to pay subscriptions to a benefit society than attend an out-patient department in a public hospital.

62. A full examination of the facts leaves one with the conviction that the logical body to provide medical care insurance is the profession itself. This concept is a revolutionary one so far as South Africa is concerned. However, it has been adopted and is operating in the USA and Canada with outstanding success. The medical profession in those two countries has sponsored, financed and promoted various medical-care insurance plans, and it is still continuing this development. Details of these schemes have been sought, but unfortunately, they have not yet come to hand. Certain information concerning the plans in the USA and Canada is set out in the Annexures to this Report.

CONCLUSION

63. The systems employed in the Transvaal and elsewhere in South Africa to promote medical-care insurance have little to commend them. The public is not receiving full protection as most schemes impose limitations which, in fact, remove the protection of insurance when it is most needed. The schemes do, however, meet the cost of casual consultations in the rooms or house visits; but is that the purpose for which these funds were formed? If it was, then these funds are not fulfilling the true purpose of medical-care insurance, which is protection against the very heavy costs which may be incurred in the treatment of serious illness. The Americans have recognised this principle by introducing the 'deductible amount'. In other words, a self-supporting family should be able to meet the costs of ordinary medical care without resorting to insurance.

64. The public may be suffering certain disabilities, but on the other hand, the plight of the profession is infinitely worse. The general practitioner to-day is facing financial ruin and domination by lay financial interests. In these circumstances it is not surprising that both the public and the practitioners are dissatisfied. The result of poor pay and overwork must inevitably be an ineffective, token medical service.

65. The Americans and Canadians have organized all their plans on a local or state basis. This is sound procedure as the men on the spot have an intimate knowledge of the local problems and the needs of the population. Ease of administration is another factor which has to be taken into account, and a subscription rate suitable to a large city may be found to be excessive when applied to the conditions which exist in a small town. Schemes such as those providing medical-care insurance seldom remain static, as they change from time to time in order to accommodate general economic and social trends. It is therefore necessary that there should be a coordinating body to ensure that a general policy should be followed. Such coordinating bodies have been formed both in Canada and the USA.

66. The introduction of a suitable plan to afford a proper service to the public in the urban centres should be comparatively easy, as it would offer the public protection which it is not receiving at present, and the profession will be relieved of many of the problems with which it is now beset.

ANNEXURE A.—EXISTING 'RULES OF THE MEDICAL ASSOCIATION OF SOUTH AFRICA TO WHICH MEDICAL AID SOCIETIES SHOULD CONFORM BEFORE RECEIVING APPROVAL BY THE MEDICAL ASSOCIATION'

1. There must be free choice of doctor.

2. The tariff of fees shall only apply to those medical aid societies which lay down a sliding scale of subscriptions according to the salaries of their members or which provide for increased subscriptions for any members earning over £1,500 per annum. In all cases, the average salaries of the members of any such society shall not exceed £700 per annum. The number of members earning more than £1,500 per annum shall not exceed 3% of the total membership. Persons with an income of more than £2,500 per annum are excluded from membership of a medical aid society.

3. In consideration of the granting of a preferential tariff, the medical aid society shall guarantee all medical fees, provided the fees charged do not exceed the rates set out in the tariff.

As the Medical Association cannot bind all its members to this agreed tariff, if a medical practitioner charges fees in excess of the tariff, all responsibility of the medical aid society for payment ceases. The member then becomes responsible for the payment of the whole fee, and shall be informed of this by the medical practitioner at the first visit.

If a practitioner accepts payment from the society at scheduled rates, this payment shall be deemed to be in full settlement of the account.

4. The restriction of medical benefits should be minimal. There should be full and comprehensive benefits granted to members, and these should include a general practitioner's service, specialist services, all operation fees, radiological fees, pathological investigations, and hospital and nursing home fees.

5. To enable a society to carry out the terms of this agreement, it is necessary that the minimum annual monetary grant should be an adequate amount. From past experience it has been found that this should be not less than £75 per annum for a member and £100 for his dependants.

The minimum annual monetary grant should be a desideratum and should not be insisted on, but the society should still be responsible for the fee, and should collect that amount from the member where this exceeds the maximum annual monetary grant to the member.

6. The medical fees shall be paid in full direct to the doctor by the medical aid society. Where a medical aid society requires accounts to be rendered direct to it, the society should incorporate in its constitution a rule which allows the nature of the illness to be disclosed to the society.

7. The fee for any operation or medical procedure not specified in the schedule should be a matter for arrangement between the doctor and the medical aid society concerned. In the case of an emergency operation or some difficult interpretation of the tariff, this cannot always be complied with, and the matter should be referred for arbitration to the Central Committee for Contract Practice of the Medical Association.

8. In the case of the full examination of any person for initial entry to a society, when the request comes from the society, the society is to be responsible for the fee, the fee to be £1 1s. per member and 10s. 6d. per dependant. In the case of a person going direct to his doctor for a health certificate, the amount of the fee is to be arranged between the doctor and his patient.

9. Patients belonging to approved medical aid societies must advise their membership to the doctor at their first consultation and exhibit their membership cards if called upon to do so. On the membership card should be listed all benefits excluded or any limitations imposed by the society, for the information of the medical practitioner.

10. The tariff provides a difference of fees for specialists and general practitioners, on the understanding that a specialist should only be available through the recommendation of the attending general practitioner, except in exceptional cases. This recommendation should be incorporated in the rules of medical aid societies.

11. Alterations to the Constitution require the approval of the Medical Association of South Africa before coming into force.

12. Except by resolution of the Federal Council no group or organization will be recognised as a medical aid society which is not confined to a single unit such as a firm, company or similar body. Should such a firm, company, etc., wish to incorporate any group of people or any individual(s) not directly employed by such firm, company or similar body into the medical aid society, permission for such incorporation must be obtained from the Medical Association of South Africa.

ANNEXURE B.—EXISTING 'RULES TO WHICH SICK BENEFIT SOCIETIES SHOULD CONFORM BEFORE RECEIVING APPROVAL BY THE MEDICAL ASSOCIATION OF SOUTH AFRICA'

1. *Membership.* This should be confined to those earning less than a basic salary or wage of £600 p.a. in the case of a person with dependants and £300 in the case of a person with no dependants. In certain cases, however, where a society can show that the

percentage of members whose basic salary exceeds £600 p.a. is more than 5% but less than 10%, approval may be granted if a sliding scale of subscriptions in proportion to their earnings is applicable and a higher capitation fee than the minimum applied, the capitation fee to be fixed by negotiation between the Branch and the society concerned. No person earning a basic income above £1,500 per annum should be eligible for membership of a sick benefit fund with a closed panel.

2. *Panel of Doctors.* The M.A.S.A. favours an open panel of general practitioners.

3. *Specialists' Appointments.* Societies shall be entitled to appoint their own specialists on approved salaries or on a membership rate of payment as laid down by the Association. Alternatively, they may have a free choice of specialist on the Medical Aid Society Tariff of Fees.

4. *Remuneration of Appointed Medical Officers.* (*a*) The rate of payment of medical officers should not be less than 22s. 6d. *per capita* per annum for European and 14s. *per capita* per annum for non-European members and the same rate should apply to dependants if included in the membership of the societies. The salary paid to medical officers should be based on this *per capita* rate. Alternatively, where membership of a Society includes dependants, the payment of medical officers should be on the basis of 67s. 6d. per member per annum for Europeans, and 48s. 0d. per member per annum for non-Europeans. It is preferable that payment be made at not longer than quarterly periods.

(*b*) The *per capita* rate of remuneration shall not include dispensing and medicines.

(*c*) Travelling allowances should be provided for in addition to the *per capita* rate where the medical officer has to visit a patient at a distance of more than 4 miles from his surgery or his residence, whichever is the nearer. Although the usual mileage charge varies in different areas, on the average it is 2s. 6d. per mile both ways. Mileage charges only to come into force after 4 miles in urban areas.

(*d*) If conditions of membership entail a medical examination and full report for entry, then the Society shall be responsible for the fee and this should be £1 1s. per member and 10s. 6d. for each dependant.

5. *Terms of Contract with Medical Officer.* These should be clearly stated and be open to any *bona fide* applicant for the post. Mileage charges should be arranged with the medical officer before he is appointed. It will be necessary for these terms of contract and the constitution of the benefit society to be submitted to the M.A.S.A. before appointments are advertised.

6. *Subscriptions.* A sliding scale of subscriptions paid by members according to their incomes will be viewed with approval by the association, and will be obligatory under certain conditions as stated in Rule 1.

7. *Benefit Fund or Sick Benefit Fund.* In the case where the employees and/or the employer start a benefit fund in any industrial or other organization, the M.A.S.A. is against any person residing that area but not employed by the organization being included as a member of the fund.

8. *Medicines.* Where the cost of medicine is included as a benefit to members, it is an advantage to the society that the member shall pay a small percentage of the cost; but the exclusion of this rule shall not preclude recognition and approval by the M.A.S.A.

9. *S.A. Medical Council Rules.* No medical practitioner can apply for any appointment unless such appointment has been advertised in the lay and medical press.

10. *The Minimum Number of Members.* The minimum number of members laid down for the formation of a benefit society should be 100 or more in order to be considered for approval.

11. *It is desirable that only Members of the M.A.S.A.* should be considered for appointments as medical officers to benefit societies.

12. *Subsidiary and Associated Companies or Firms.* Benefit societies must obtain the approval of the M.A.S.A. before accepting as members the staff of subsidiary and associated companies or firms.

13. *Forfeiture of the Association's Approval.* Any indication of a society attempting to exploit the Medical Profession shall lead to forfeiture of the Association's approval. The Association reserves the right to withdraw its approval from any medical benefit society by giving 3 months' notice for a review of the conditions of service and terms of appointment in respect of its medical officers.

14. *Advertising of Appointments.* Appointments to medical benefit societies shall be advertised in the South African Medical Journal, and advertisements so submitted for publication shall be accompanied by (*a*) the constitution, rules and regulations of the society, (*b*) conditions of service and remuneration for the doctor, (*c*) income group of the society, (*d*) the number and type of membership of the society.

4 *May* 1955.

ANNEXURE C.—MEDICAL CARE INSURANCE SPONSORED BY THE PROFESSION IN CANADA

Letter by Dr. S. S. B. Gilder, Co-editor of the Canadian Medical Association Journal, which appeared in the issue of the World Medical Journal of March 1955:

VOLUNTARY MEDICAL CARE INSURANCE

'It is the affirmed policy of the Canadian Medical Association to encourage the development by the medical profession of its own voluntary insurance plans for medical care. Much has been done in Canada to sponsor such plans, and an agency, Trans-Canada Medical Plans, sponsored by the Canadian Medical Association, now exists to coordinate various provincial schemes. The Department of National Health and Welfare of the Federal Government has recently produced an analysis of 14 Canadian non-profit voluntary agencies providing medical care on prepayment. This analysis shows that non-profit medical insurance in Canada, mostly sponsored by the medical profession, has grown at an astonishing rate from a membership of 13,000 in 1939 to 2 million in 1953 (out of a population of under 15 million). Indeed, nearly 20% of the incomes of Canadian physicians now comes from some form of prepayment insurance scheme. An attractive feature of some doctor-sponsored schemes is that they offer at different rates of premium a variety of extents of coverage for sickness.

The great majority of persons are insured on group contracts for which no health examination is usually required on entry, and in which there is no income bar. Analysis shows that use of medical services has not been excessive; the annual average of services received per member in a group analysed varied from 2·9 to 4·2. The analysts point out that, contrary to what might be expected, *it is not the costly major surgical operations which present a problem in operating insurance schemes, but the minor recurring items of expenditure.*

It is felt that the continual increase in coverage of the population by voluntary insurance, with employer participation in payment for groups of employees and possible government payment of premiums for those unable to pay their own way, will obviate the need for State medicine.'

Letter dated 24 *May* 1955 *by Dr. A. D. Kelly, General Secretary of the Canadian Medical Association, to the Public Relations Officer, Medical Association of South Africa:*

'Your letter of 10 May calls for an answer which might be regarded as a short course in medical economics. I am glad that you defined the terms Benefit Society and Medical Aid Society because the former has no exact counterpart in this country, and I gather that the latter is a development which with you is lay organized and administered. We have a few such plans, mainly devoted to providing hospital-care insurance and they are termed Consumer Cooperative Health Plans in Canada and the US.

The really significant developments on which you want information are the medically sponsored plans of prepaid medical care. These are non-profit organizations which have been sponsored, endorsed, organized and financed by the medical profession in the 10 provinces of this country. The province is our unit of health-service organization, and the function of the national Association is to coordinate the activities of the provincial Divisions. This we have done in the case of the prepaid medical care plans by organizing them all into Trans-Canada Medical Plans.

Growing up as they did, by the Profession in the 10 provinces recognizing the need to provide a means of budgeting against the cost of medical services, we find that they represent every variation in structure. At one time we placed great importance on mdeical control of these plans. They were our own creations, and we wanted to make sure that they did not escape from our influence. The governing body was so set up that a substantial majority of the directors must be doctors and any laymen who were appointed to the directorate were there by the grace of the doctor members. I believe that it is accurate to say that we now feel much less strongly on this matter, and we have examples of plans where the

voting strength at the directors' level shows a majority of laymen. The medical influence, however, is very great and we feel that majority control is not essential. These plans of ours are set up as separate corporations in their various provinces, and they are not operated as committee activities of any of our provincial Divisions. The relationship is reasonably close, however, and in most instances the plan is responsive to the desires of the medical organization which sponsored it. We have one example where a plan asserted its independence and refused to act in accordance with the wishes of the medical organization which originated it To summarize, I feel that medical control is achieved when doctors take the responsibility of organizing a prepaid plan or medical aid society, regardless of whether they retain majority voting control.

The other element of control which is very important is that designed to protect the fund against excessive demands by subscriber or physician. A medically sponsored plan can control the doctors who would raid the fund, much better than a lay society can. Elimination of items or excessive service or taxing the whole account are the devices which we have found most effective in curbing the medical outlaw, and even he will accept these controls from his colleagues.

Under separate cover I am sending you a copy of the Charter and Regulations of Physicians' Services Incorporated, a typical medically sponsored prepaid medical-care plan and a leaflet describing Trans-Canada Medical Plans, a nation-wide coordinating body.

I hope that this information answers most of the questions you have in mind, but if there is any further specific data, please do not hesitate to ask for it.'

AN ARTICLE IN THE CANADIAN MEDICAL ASSOCIATION JOURNAL, BY C. HOWARD SHILLINGTON, TORONTO

TRANS-CANADA MEDICAL PLANS—A PROGRESS REPORT

What is the organization known as Trans-Canada Medical Plans? Why was it founded? What does it do? To a great many doctors in Canada these are still pertinent questions, partly because the organization is comparatively new and partly because, unlike its Member Plans it is not directly engaged on a day-to-day basis with the doctor in his practice.

Trans-Canada Medical Plans (TCMP) is the national correlating agency of all the prepaid medical-care plans in Canada sponsored or approved by the Canadian Medical Association. It was founded to promote the establishment and operation of voluntary, non-profit, prepaid medical-care plans in Canada to meet the health needs of the public generally; to coordinate the activities, methods, procedures, coverage and data of volunatry, non-profit, prepaid medical-care plans in Canada; to prepare statistical or other information, and to provide counsel or assistance to the medical-care plans and to the public in all matters pertaining to the provision of prepaid medical care on a voluntary, non-profit basis; to arrange for the provision of medical care on a national basis through the medium of voluntary, non-profit prepaid medical plans; and to assist in the development of an informed public opinion on matters of health. TCMP was organized as the medium for carrying out the mandate of Canadian medicine as set out in the Canadian Medical Association Statement of Policy in 1949:

(*a*) The establishment and /or extension of these Plans to cover Canada.

(*b*) The right of every Canadian citizen to be insured under these Plans.

(*c*) The provision by the State of the health insurance premium in whole or in part for those who are adjudged to be unable to provide these premiums for themselves.

Functions of TCMP.

TCMP has a two-fold purpose. With the aid and organization of the Canadian Medical Association and the various provincial, medically sponsored or approved medical-care plans making up its membership, TCMP is established to direct, at the national level, a programme of health insurance on a voluntary basis, thus providing the opportunity for the great percentage of Canadian citizens to protect themselves and their families. Secondly, the organization assists its provincially incorporated Member Plans in the development and provision of the services required to meet the objectives of national policy; this is something which no single Plan could do. The results may be considered under six headings:

Inter-Plan Transfers. A subscriber to any Member Plan in Canada, on transfer or change of residence from one part of the country to another, is now able to retain his seniority of coverage under any of the Member Plans on transfer to the Plan in his new area, thus retaining continuous protection. This arrangement is the result of developments taking place over the past 5 years. While this has not meant the same level of coverage in all areas it has been a great boon to subscribers, and expressions of appreciation to the Member Plans for the provision of such facilities have indicated widespread approval. Indeed, it has provided an adequate answer to one of the complaints which the labour movement voiced in its report to government a year or two ago—that health plans presently available were essentially local in character and a deterrent to the free movement of labour, tending to bind the labourer to his employment, whereas it was in the national interest that workers be easily transferred from job to job within the country. Since the official adoption of the TCMP Inter-Plan Transfer Agreement a year or more ago, further refinements have been made in the administrative procedures, with increased efficiency in the provision of this additional service to the public.

Extension of Coverage. If voluntary health protection is to be the right of every Canadian citizen, obviously in all provinces of Canada ways and means must be found by the provincially incorporated plans rendering the services in the national project to expand their coverage to accomplish the objectives of the national policy. During the past year we have seen an extension of coverage in some of the provinces with the introduction of individual enrolment plans the development of other arrangements which will enable an increasing percentage of our citizens to obtain protection. It is expected that this trend will continue.

Arrangements for National Employers. Considerable attention has been given to evolving the most satisfactory arrangements by which national employers of labour may insure their employees in the various areas in which they are located. This has involved the gradual development of two separate arrangements: (*a*) A national uniform contract providing uniform services and uniform rates on a composite rate basis and operated through one central pay source; and (*b*) a coordinated enrolment arrangement which offers the employer a reasonably similar type of coverage (either comprehensive or limited) for his employees across the country and involves coordination in respect to enrolment only, but enables the employees to be protected under the coverage provided by each Plan in its local area.

Each of the Member Plans of TCMP started almost as an isolated project in a local area and developed its own regulations. As each Plan developed and assumed added responsibilities, the need to work together became more apparent. When these Plans undertook to provide coverage for national groups, the necessity for achieving some degree of uniformity in regulations became more important than ever.

One of the major problems of the past 2 or 3 years has been the working out of uniformity in many of these regulations, but this has been an increasingly successful accomplishment of the national body. This important work, it is hoped, will be largely completed in the near future.

Statistics. The value of adequate statistics to the medical care plans cannot be over-emphasized. Without them a Plan is helpless and without control. The accumulation of adequate statistical information is an important function of TCMP. At the end of 1953 there became available for the first time a comprehensive report on costs of medical care provided by Member Plans in every province of Canada. Higher standards of reporting and more complete information in this respect continue to be an objective of the TCMP organization.

Improved Management. Perhaps the greatest single contribution of such a national organization is the greatly increased exchange of ideas and knowledge among all Plans concerned. In the beginning, when each Plan was small, there was little experience or knowledge to guide their development, and each Plan depended almost solely upon the knowledge and experience of local management. When the Plans were not large mistakes could be made without affecting too many people. As each Plan has grown, with an increasing responsibility to the public because of numbers enrolled and money invested, a correspondingly heavier responsibility has arisen to provide an arrangement for health services which meets the desires of the public, protects the welfare of the doctors, and avoids mistakes which would cause serious repercussions to the Plan and to the whole cause of voluntary

prepaid health care. While such programmes have shown an amazing growth in Canada in the post-war years, it must be remembered that the prepayment system is only a few years old; and while it has come a long way, there may be changes, adaptations or methods and many variations of the original before the system most suitable for Canadian needs is found. There has been an increasing need for consultation and exchange of ideas at all levels of management, to ensure the satisfactory growth and development of such programmes.

The basic cause of failure of 1,093 Canadian businesses in 1953, as cited in a recent issue of a Canadian financial magazine, was ascribed in 89·9% of cases to lack of background knowledge, lack of managerial experience, unbalanced experience or incompetence. The greatest single factor was lack of managerial experience (35·9%). As the Plans are engaged in the operation of an insurance arrangement more intricate and difficult than many types, some of which have had actuarial records of one hundred years or more to guide them, it becomes very important to ensure continued development of sound principles of management to safeguard the success of the voluntary health movement as sponsored by Canadian medicine.

To-day each Plan, in undertaking new obligations of enrolment or new developments of other kinds, has behind it and available for its information and assistance the sum total of experience of all Plans, representing coverage of more than 2 million people.

National Unity. A valuable development has been the creation of a national entity, able through its facilities to carry out the policy which Canadian medicine has enunciated in respect to the needs of the Canadian people. It might be said that Canadian doctors support the adoption of the principles of health insurance on a voluntary basis for 3 chief reasons. First of all, they have seen amply demonstrated the practical application of the prepayment principle in the growth of the various voluntary prepaid plans across Canada. Secondly, they support a principle providing for a certain amount of individual responsibility as well as privilege, as enunciated in the voluntary approach to health insurance. Thirdly, they recognize that an outstanding characteristic of the voluntary plans is the provision of virtually any scope of benefits in the public interest. Canada's standards vary greatly in respect to health services and facilities. Through their development at the local level, through their growth and experience, and through competitive effort, the voluntary plans have done a remarkable job in adapting their programmes to the needs of the people in the area in which they operate. The contribution of many persons in many areas, in a coordinated arrangement of mutual benefit, will do much to make it possible for the voluntary programmes to meet the challenge of a national programme of health insurance.

ANNEXURE D.—THE HISTORY OF MEDICAL-CARE INSURANCE IN THE USA

The following information was abstracted from a booklet prepared by the Council on Medical Service of the American Medical Association. The information is by no means complete, but what is given, is most informative.

It appears that voluntary pre-payment medical-benefit plans gained impetus from the severe financial depression which commenced in 1929. This depression caused many self-supporting individuals to lose their means of earning a living and consequently to become dependent on public assistance.

Initially, the medical profession in the USA provided medical care free of charge for the indigent. As the depression increased in severity, federal and state relief programmes were initiated. Plans were evolved in the various states by medical societies acting in conjunction with the authorities for the provision of medical care. Basically, the plans were that the profession guaranteed to provide medical care for the limited funds made available by the authorities. These funds were then distributed among the profession on a *pro rata* basis according to the amount of work done. These arrangements later provided a basis for pre-payment plans.

During this period the medical societies considered the problem of providing some means of insurance of medical-care costs. Various branches of the profession in different states established medical service bureaus. It was the function of these bureaus to assist families in budgeting their medical bills on a pre-payment and post-payment basis. In the case of the low-income groups, they acted as coordinating agencies and assisted the group by arranging for payment of medical services in keeping with the income of the persons concerned.

The following paragraph is quoted in full from the booklet prepared by the Council on Medical Service of the American Medical Association: 'Pre-payment medical (and hospital) plans developed more extensively in Washington and Oregon. *The Provisions of the Workmen's Compensation Act in these two states were interpreted to mean that the employers could use the funds collected under the Act to contract for medical services for employees. All the evils of contract medical practice developed, resulting in lowered standards of medical services, insufficient payments to physicians and others providing the service, and domination by lay financial interests.* In order to correct this situation, local medical societies undertook to act as the contracting agencies. Medical Service Bureaus were developed in most of the counties to act in this capacity. These Bureaus soon expanded into pre-payment plans for medical and hospital care.'

The description quoted in the preceding paragraph is of great importance. It is an exact description of the present state of affairs in Witwatersrand area because the present system has led to (*a*) a lowered standard of medical services, (*b*) insufficient payments to the profession for services rendered, and (*c*) domination by lay financial interests.

The author of the booklet then goes on to state: 'During this same period, 1930 to 1940, the voluntary pre-payment hospital-benefit plans came into existence. From the very beginning, these plans received local as well as national support from civic leaders, welfare administrators, hospital boards, the hospital associations and medical societies.'

The fact remains that the profession in the US and Canada has organized these medical insurance plans for the mutual benefit of the public and the profession. All the organization was done by the local societies with the full recognition and support of the American Medical Association; and the House of Delegates of the Association, realizing the necessity for guidance in the formation of the pre-payment plans, laid down the Ten Principles quoted earlier in this report.*

These Principles were adopted in 1934. At that time, no attempt was made to develop a model plan. This was due to 3 conditions, viz. (1) lack of experience and data, (2) the hesitancy of the profession to plunge into a project without proper examination, and (3) a lack of appreciation on the part of the public of the desirability of budgeting for the costs of medical care.

However, the attitude of the House of Delegates was clarified in 1938, when it adopted the following statements:

'Your committee is unanimously of the opinion that state and county medical societies cannot afford not to develop for their respective jurisdictions the most accurate and complete information that will enable them, with the assistance of the correlated professions and other agencies concerned with medical and preventive medical services and facilities, to maintain, continuously, medical care that is sufficient in amount and satisfactory in quality.

Your committee unanimously concurs in the suggestion and recommends that the American Medical Association adopt the principle that in any plan or arrangement for the provision of medical services, the benefits shall be paid directly to the individual member.

Thus, the direct control of medical services may be avoided. Cash benefits only will not disturb or alter the relations of patients, physicians and hospitals.'

By 1939, the various plans had reached the stage of developing into state-wide pre-payment medical care plans. The California Physicians Service in February 1939 was the first to launch a state-wide plan. This plan together with the county medical society bureaus in Oregon and Washington provided the information on which the profession developed a national programme. Thereafter the growth of the plans in various states was rapid.

In order to understand the following, it is necessary to quote the definitions of the terminology used:

Type of Contract. For comparative purposes only 3 types of contracts (sometimes referred to as types of plans) are used in the brochure: (1) 'Service' refers to a contract which provides benefits in terms of physicians' services. (2) 'Cash indemnity' refers to a contract which provides benefits in terms of money as set forth in a given 'schedule of indemnities'. (3) 'Combination service and cash indemnity' refers to the use of both in a contract. In such instances, the 'service' often applies only to a specified income group (see 'Income Limits').

Income Limits. It is recognized that the incomes of persons determine their ability to pay; therefore, for certain income groups the physicians agree to provide the benefits without additional

charges. To this extent a contract becomes a service contract. Where additional charges are allowed, the contract is classified as cash indemnity.

With the wealth of data which became available following the development of many state-wide Schemes, various experiments were carried out, particularly in regard to the provision of services for the low-income groups. It was found as a result of these experiments that in some instances a medical-service contract best served the purpose of providing medical care. The House of Delegates recognized this in 1942 when the following resolution was taken: 'Resolved, That the House of Delegates of the American Medical Association approves that principle of medical-service plans on a service basis when sponsored by a constituent state medical association or a component county medical society in accordance with the recommendations relating to medical service adopted by the House of Delegates.'

The advent of the Second World War prevented further study and experimentation. However, in June 1943, the American Medical Association set up a 'Council on Medical Service and Public Relations, later shortened to 'Council on Medical Service'. The duties of this Council are:

(i) to make available facts, data and opinions with respect to timely and adequate rendition of medical care for the American people.
(ii) to inform constituent associations and component societies of proposed changes affecting medical care in the Nation;
(iii) to inform constituent associations and component societies regarding the activities of the Council;
(iv) to investigate matters pertaining to the economic and social aspects of medical care;
(v) to study and suggest means for the distribution of medical service to the public consistent with the principles adopted by the House of Delegates; and
(vi) to develop and assist committees on medical service originating from constituent associations and component societies of the American Medical Association.

The Council on Medical Care then assumed the function of assisting in the promotion of voluntary pre-payment plans. The actual promotion of the plans was carried out, at state and local levels, by the plans themselves, by the medical societies, and by the doctors. The Council sponsored a series of conferences in 1945 in response to a number of resolutions calling for the adoption of voluntary pre-payment medical care plans. The desire was for the immediate setting-up of a national plan on a volunatry basis.

A Division on Pre-Payment Plans was then set up by the Council, and it assisted in the re-organization of the Council on Medical Service Plans into Associated Medical Care Plans. Material and data was gathered on all plans and studies prepared on enrolment, administrative costs, claims paid and other phases of the problem. Where no plans existed, the Council offered its staff to assist. *This was done in the belief that each constituent society should be free to develop the type of benefit programme best suited to the needs of a particular area.* This view was confirmed by the House of Delegates in June 1949, when the following statement was adopted:

'The American Medical Association is not engaged in the insurance business and has no intention of giving a preferential standing to any type of voluntary plan. The American Medical Association does believe, however, that it has a definite function to perform, that of evaluating any insurance plan presented to the people, thus protecting them as far as possible against unscrupulous or unsound plans. The American Medical Association further believes that the people should be free to purchase the type of health security they desire. To this end, the Council on Medical Service for the past 4 years has critically examined various plans and has given its approval to numerous plans operating on a local or state basis.'

A set of 'Standards of Acceptance' formulated by the Council was applied to all plans, and if the plan was approved, it was granted the privilege of using the 'Seal of Acceptance' of the Council on Medical Service. The 'Seal' provided a simple, effective emblem for identifying to the public those plans which were medically approved. In 1954 it was decided to discontinue the acceptance plans, as it was felt that they were sufficiently well-known to the public. Another reason for discontinuance was the difficulty experienced in keeping pace with State laws. Although the 'Seal' was discontinued, the Standards and Principles still apply.

It is reported that many problems still exist. Apparently the Americans are also faced with the problem that too many persons seek to finance all medical costs through the plans. This is regarded as being an unsatisfactory state of affairs, as it will prevent the voluntary programmes from reaching their true maximum effectiveness. Another problem being dealt with is the improper classification of professional services as institutional services by insurance companies providing hospital insurance services. In December 1953 the House of Delegates of the American Medical Association had to take action against one of these companies.

The current experiments being conducted in the USA are concerned with the provision of insurance against the costs incurred in long-term illness. The earlier plans provided only for short-term illnesses which caused severe financial hardship. This means the plans provided protection against catastrophes of a short nature, but the long crippling illnesses were not covered. *Routine consulting-room and house calls were left to the individual to pay, as it was reasoned that most self-supporting individuals could meet these costs without suffering hardships.*

In order to meet the critics of the plans then organized to provide cover for short-term illnesses, the present experiments were organized. The concept of a 'deductible amount' was advanced—a device used in other forms of casualty insurance. Policies are now being issued by the plans, covering all expenses up to a total of say £3,000, provided the first £100 is met by the patient. Other policies combine the deductible feature with the principle of co-insurance. For example, the plan underwrites say 80% of the amount in excess of the deductible amount. The insurer must then pay the costs up to the total of the deductible amount plus the balance of 20%. The principle of co-insurance is advocated by many plans, as the patient has a financial interest and helps to minimize expenditure on unnecessary care.

Other plans limit the total amount to be spent on medical fees to a total of £350 or more, with amounts of £2, £5 or £15 deductible according to the premium paid, which is based on the total cover and the amount of expense the insured wishes to bear. Another variation is to issue a policy covering specified diseases. These policies are now being varied to include chronic conditions which may develop from an acute illness. All these plans provide that the deductible amount applies to each member of the family covered for each disability.

A family-budget plan is also being tested. Here the insurer agrees with the family that an amount of say £2 should be budgeted for each month as medical expenses. This is then regarded as the deductible amount, and the insurer meets the balance of expenditure up to a stated amount. In this case, the deductible amount applies to all the expenditure incurred by the family collectively each month.

Still another variation is that, after the maximum coverage has been met by the insurer, the family will then pay the next £30 of expenditure. The financial assumption of this intervening expenditure by the family is referred to as 'corridor' coverage. This means there is a space in which the insuring organization does not participate in further costs.

Under major-expense insurance, the individual is protected from the economic consequences of prolonged illness, a circumstance which will relieve him from worry and, in many cases, shorten the recovery period. In nearly all major-expense policies, the benefits are limited in respect of each service. Maximum amounts are stated for hospital expenses, surgeons' and physicians' fees, etc.

The principle of 'deductible' is twofold: (1) To transfer the initial expenditure to the individual; and (2) to keep premium levels within the reach of the greatest number of people.

Co-insurance acts as a deterrent to those who wish to buy 'benefits' instead of 'protection'.

The benefits usually excluded from these policies are: Confinements, dentistry (excepting accident injuries), treatment of alcoholism or narcotic habits, cosmetic surgery (excepting disfigurement caused in accidents) and routine physical and eye examinations. However, on the other hand, there is on record a number of instances where unforeseen contingencies not included in the policy have been met by the insuring company.

A most significant statement in the booklet now being reviewed is quoted in full:

'Many of the spokesmen for employee groups express a preference to establish their own plans to the end that they may determine that health services might be available. Some of the suggested programmes would apparently alter the traditional patient-physician relationship since employees (and perhaps their dependents) would have no freedom of selection of physician at the time of need for medical services.

'One of the salient features of a great majority of voluntary health insurance programmes is non-interference by any third party when

an insured person wishes to select his own personal physician. The right of free choice of physician has been traditional and has co-existed with an era that has witnessed some of the greatest medical and health advances in history. *Any programme which would eliminate the feature of freedom of choice should be viewed not only with concern for its effect on the medical profession, but perhaps with greater concern for its ultimate effect upon the American people.*'

It is evident that the profession in America took prompt and effective action as soon as benefit societies were formed, because under that system the profession is poorly paid and overworked—two conditions which must inevitably lead to an ineffective token medical service. From the foregoing, it is also evident that there are still forces at work in American which are attempting to exploit the profession.

The undermentioned figures give an idea of the strength of the movement in the U.S.A.:

	Number of People Protected		
Type of Protection	31.12.52	31.12.53	*Increase in* 1953
Hospital Expenses ..	91,667,000	98,793,000	7·8%
Surgical Expenses ..	73,161,000	82,347,000	12·6%
Medical Expenses ..	35,797,000	42,910,000	19·9%

The entire population of the USA at 31 December 1953 was approximately 160,000,000, and the increase in the total population during the calendar year was 1·6%.

There are apparently three classes who are not included in the above figures, and they are:

(i) The members of the armed forces who receive their medical care through the Federal Government;

(ii) Persons who have sufficient income to meet the costs of medical, surgical and hospital costs directly;

(iii) The poor who normally have access to medical and hospital services at the direct expense of the local government.

From the foregoing it would appear that the movement has nearly reached its full development in so far as hospital protection expense is concerned, and that the other two types of insurance is being taken up fairly rapidly. The explanation of the fact that more persons carry hospital expense insurance is that it commenced about 1934, and comparable development of medical and surgical expense insurance did not commence until some years later.

PASSING EVENTS : IN DIE VERBYGAAN

Dr. H. Ludwig Naudé, M.B., Ch.B., who since 1950 has been in practice at Balfour, where he is R.M.O., has accepted an appointment with Rhodesia Cement Ltd. at Colleen Bawn, S.R. He leaves with his wife on 1 February 1956.

* * *

The portrait of the late Dr. Peter Allan which appeared in the In Memoriam notice in the *Journal* of 28 January, was from the studio of Constance Stuart, Pretoria.

Dr. D. M. Krikler left Cape Town on 3 February for the UK and the USA, accompanied by Mrs. Krikler. Dr. Krikler is the holder of a Fellowship in Gastro-enterology at the Lahey Clinic, Boston, USA, which he will take up in 1956.

* * *

Dr. Louis Resnick has moved to 2807 Dumbarton House, Cape Town.

CORRESPONDENCE : BRIEWERUBRIEK

PHENYLKETONURIA

To the Editor: I should like to make the following addendum to my article *Phenylketonuria case report in a European child treated with a diet low in phenylalanine*[1] which appeared in the last issue of the *Journal*.

Since this article was written the patient has begun to say simple words like ma-ma-ma and pa-pa-pa; he obeys simple commands; his abilities have shown a marked improvement in that he helps with dressing, gets in and out of his pram and gets on to a chair on his own.

He is no longer excitable; he shows marked affection for his mother; he is able to concentrate longer.

H. Braude

107-9 K.G.I. Building
Kroonstad

21 January 1956

1. Braude, H. (1956): S. Afr. Med. J., **30**, 83.

DR. SICHEL'S NEW YEAR MESSAGE

To the Editor: Dr. Sichel's belated sermon contains elements of the comical. I wonder whether he knows that there are still numerous medical men in South Africa who under difficult circumstances still care for the sick and often cure them without primarily worrying about the fees, and without expecting payment at the very latest C.O.D.

Have these sentiments never arisen during his sojourn on Federal Council, which body sold us all down the line to the Medical Aid Societies? No, the commercialism in the profession is surely the said Council's baby.

G. P. Fourie

S.A. Mutual Buildings
Cape Town

22 January 1956

MEDICAL FEES

To the Editor: Had Dr. Beck[1] ever been a member of Federal Council he would have realized that the chairmanship of Federal Council by Dr. Sichel has been characterized by Dr. Sichel's unfailing impartiality. At no time have Federal Council decisions been unduly influenced by Dr. Sichel. The temporary 10% allowance to Medical Aid Societies agreed to by Federal Council was the result of the expressed wish of an overwhelming majority of the members of the Association who replied to the questionnaire. I can assure Dr. Beck that the revised and improved tariff of fees negotiated after this gesture by the Association was in spite of and not because of the efforts of Dr. Beck and his friends, who incidentally merely lowered the prestige of the Association.

The only tariff of fees negotiated by Federal Council from time to time has been the Medical Aid Tariff. Private fees have always been a matter which concerned Branches or Divisions or individuals. Capitation fees for Benefit Society work have also been a matter for Croups or Branches or Divisions to negotiate. Some 10 years ago Federal Council did lay down what they considered to be a minimum capitation fee to be negotiated for, and it has taken many years in some areas for this minimum to be reached. Unless, therefore, the bulk of Dr. Beck's income has, during all the years he has been in practice been derived from Medical Aid work, to the exclusion of private practice and Benefit Society appointments, I fail to see how Federal Council can be responsible for the difficult economic position he finds himself in.

The mere fact that Dr. Sichel was never a general practitioner or, according to Dr. Beck's statement, has grown rich, has certainly nothing whatever to do with the question of the economic status of the profession.

C. A. H. Green

P.O. Box 5937
Johannesburg
24 January 1956

1. Beck, J. H. M. (1956): A. Afr. Med. J., **30**, 72 (21 January).